BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : IHC 3,9 Y Test sheet : 7.10.86 Edition : 9.85 replaces : ISO-4113 Calibrating oil : VE 4/11F1150 R140 Injection pump Type number : 0 460 414 009 Customer-specific information Customer Engine : DT 239/856 TEST BENCH REQUIREMENTS Calibrating-oil return temp. °C with thermometer : 40...48 electronically : 42...50 Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 020 assembly Opening bar: 172...175 pressure Perforated-plate diameter mm : 0.6Test inj. tubing : 1 680 750 017 Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length Start of delivery mm : 0,2+-0,02 Prestroke (from BDC): (0,04) Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 800 Speed Charge press. hPa: 800 Setting value mm: 4,5...4,9 Supply-pump pressure:

1/min: 800

Charge press. hPa: 800

Setting value bar: 5,3...5,9 Full-load del. with charge press.: 1/min: 800 Speed Charge press. hPa: 800 Del.quantity cm3/ 1000H: 92,2...93,2 Dispersion cm3/: 3,5 1000H: -Full-load del. w/out charge press.: 1/min : 500 Del.quantity cm3/ 1000H.: 75,5...77,5 Low-idle speed regulation: Speed 1/min: 350 Charge press. hPa: -Del.quantity cm3/ 1000H.: 23,0...27,0 Dispersion cm3/: 3,5 1000H.: -Full-load speed regulation: Speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/ 1000H: 22,0...28,0 Start: 1/min: 100 Speed Charge press. hPa: -Del.quantity mind. cm3/1000H.: 100 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 400 Charge press. hPa: 800 TD travel mm: 0,8...1,6 mm: (0,5...1,9)1/min: 800 2nd speed Charge press. hPa: 800 TD travel mm: mm: (4,5...4,9) 1/min: 1150 3rd speed Charge press. hPa: 800 mm: 5,3...6,0 mm: (5,0...6,3) TD travel Supply-pump pressure characteristic:

1st speed 1/min: 400	<pre>I Zero delivery (stop):</pre>
	t 2010 decrivery to copy.
Charge press. hPa: 800	
Supply-pump	Mech. shutoff:
pressure bar: 5,14,5	Speed 1/min:-
pressure bar: 3,74,3 2nd speed 1/min: 1150	<pre>Del.quantity cm3/: -</pre>
Charge press. hPa: 800	1 1000H.
Supply-pump	1
anaccina han 6 / 7 0	l 1 Classe skutsti
pressure bar: 6,47,0	l Electr. shutoff:
1	l Speed 1/min: 1150
Overflow quantity at overflow valve:	I ELAB volt: -
	<pre>Del.quantity cm3/: -</pre>
1st speed 1/min: 500	I Del.quantity cm3/: - I 1000H.
Charge press. hPa: -	1
Overflour . 55. 170	i I Tallo dolinomia
Oveflow : 55138	! Idle delivery:
quantity cm3/10s: (40153)	
2nd speed 1/min: 1150	l 1st speed 1/min: 350
Charge press. hPa: 800	Del.quantity cm3/: - 1000H.: (20,529,5)
Overflow : 55138	1000H.: (20.529.5)
quantity cm3/10s: (40153)	I 2nd speed 1/min: 400
qualities chis/103. (40155)	1 Dol supptitu op7/4 5 0 11 0
Dalaman make a transfer of	Del.quantity cm3/: 5.011.0 1000H.: (3.512.5)
Delivery-quant. and breakaway char.:	1000H.: (3,512,5)
1st speed 1/min: 800	l 3rd speed 1/min: 450
Charge-air pressure-setting	Deliquantity cm3/: -
point hPa: 300	1000H.: 03,0
LDA stroke mm: 4,9	1
Dol grantity and 1 00 /	l 1 - Armanadia abaatiaa fisal dalissamssa
Det. quantity cm3/: 00,490,4	Automatic starting fuel delivery:
Dol.quantity cm3/: 86,490,4 1000H.: -	
I 2nd speed 1/min: 1300	l 1st speed 1/min: 220
Charge press. hPa: 800 Del.quantity cm3/: -	Del.quantity cm3/: -
Del quantity cm3/: -	ind. 1000H: 100,0
1 bo a qualitative class .	
10004 0 25	1
1000H.: 02,5	
3rd speed 1/min: 1270	l I 2nd speed 1/min: 300
1000H.: 02,5 3rd speed	l I 2nd speed 1/min: 300
1000H.: 02,5 3rd speed	l I 2nd speed 1/min: 300
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: - 1000H.: (21,529,5)	2nd speed 1/min: 300 Del.quantity cm3/: - 1 ax. 1000H: 80,0
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: - 1000H.: (21,529,5) 4th speed 1/min: 1230	l I 2nd speed 1/min: 300
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet:
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: - 1000H.: (21,529,5) 4th speed 1/min: 1230 Charge press. hPa: 800 Del.quantity cm3/: 66,074,0	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: - 1000H.: (21,529,5) 4th speed 1/min: 1230 Charge press. hPa: 800 Del.quantity cm3/: 66,074,0 1000H.: (65,574,5)	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0
1000H.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0
TOUCH.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions:
TOUCH.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/: - ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation
TOUCH.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm :
TOUCH.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : - KF mm : 5,25,4
TOUCH.: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
1000H: 02,5 3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:
3rd speed 1/min: 1270 Charge press. hPa: 800 Del.quantity cm3/: -	2nd speed 1/min: 300 Del.quantity cm3/:- ax. 1000H: 80,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm : 5,25,4 MS mm : 1,21,4 SVS max. mm : 5,0 XK mm : 20,222,2 XL mm : 12,315,7 Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : STE 4.0 H : 30.9.86 Edition : 7.84 replaces : ISO-4113 Calibrating oil : VE 4/11F1100 R94-1 Injection pump : 0 460 414 011 Type number Customer-specific information Customer : STEYER Engine : WD 411.89/90 TEST BENCH REQUIREMENTS Calibrating-oil oC return temp. with thermometer : 40...48 electronically : 42...50 Inlet press., bar: 0.2 Calibrating nozzle-holder assembly : 1 688 901 000 Opening bar: 147...150 pressure Test inj. tubing : 1 680 750 017 : 6 Outside diameter x Wall thickness : 2 mm: 840 x Length Injection-pump setting values Test specifications in parentheses Timing-device travel: Speed 1/min: 1000 Setting value mm: 5,2., 5,6 Supply-pump pressure: Speed 1/min: 1000 Setting value bar: 5,2...5,8 Full-load del. w/out charge press.: 1/min: 1000 Speed Deliquantity cm3/ 1000H.: 73,5...74,5 cm3/: 3.0Dispersion 1000H.: -

Low-idle speed regulation: Speed 1/min: 300 Del.quantity cm3/ 1000H.: 11,5...15,5 Full-load speed regulation: Speed 1/min: 1150 Deliquantity cm3/ 1000H: 50,0...56,0 Start: Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 70.0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 500 1st speed TD travel mm: 0,8...1,6 mm: (0,5...1,9)1/min: 1100 mm: 5,9...6,7 mm: (5,6...7,0) 2nd speed TD travel Supply-pump pressure characteristic: 1/min: 500 1st speed Supply-pump bar: 2,8...3,4 1/min: 1100 pressure 2nd speed Supply-pump bar: 5,7...6,3 pressure Overflow quantity at overflow valve: 1/min: 1100 1st speed Oveflow : 55...138 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1270 1st speed Del.quantity cm3/: -1000H.: 0...2,0 1/min: 1200 2nd speed Del.quantity cm3/: 14.0...22.0 1000H.: (13.5...22.5) 3rd speed 1/min: 1150 Del.quantity cm3/: -1000H.: (48,5...57,5) 1/min: 1080 4th speed Del.quantity cm3/: 72,5...74,5 1000H.: (70,8...76,2) 5th speed 1/min: 1000

```
Del.quantity cm3/: -
1000H.: (71,3...76,7)
6th speed 1/min: 500
6th speed
Del.quantity cm3/: 66.0...70.0
1000H.: (64.6...71.4)
Zéro delivery (stop):
              1000H.
Idle delivery:
1st speed
               1/min: 300
Del.quantity cm3/: -
1000H.: (9,0...18,0)
               1/min: 340
2nd speed
Del.quantity cm3/: -
1000H.: 0...1,5
3rd speed
              1/min: 400
Del.quantity cm3/: -
1000H.: 0...1,0
Automatic starting fuel delivery:
               1/min: 170
1st speed
Del.quantity cm3/: -
                1000H: 70,0
 ind.
               1/min: 250
2nd speed
Del.quantity cm3/: -
               1000H: 65,0
Shutoff electromagnet:
Cut-in
 min. voltage
Rated voltage
Mounting and assembly dimensions:
Designation
                     : 3,,2-3,4
: 5,2-5,5
: 0,9-1,1
K
                mm
KF
                mm
MS
                mm
SVS max.
                mm
Remarks:
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : IHC 3,9 Y6 Test sheet Edition : 12.12.86 replaces Calibrating oil : ISO 4113 : VE 4/11F1090 R176 Injection pump : 0 460 414 016 Type number Customer-specific information Customer : IHC Engine : D239-E833 TEST BENCH REQUIREMENTS Calibrating-oil return temp. with thermometer : 40...48 electronically : 42...50 Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 020 assembly Opening bar: 172...175 pressure Perforated-plate mm:0.6diameter Test inj. tubing : 1 680 750 017 Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length Start of delivery Prestroke mm : 0,2(from BDC): +-0.02(0.04)Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 800 Speed Setting value mm: 4,8...5,2

Speed 1/min : 800 Del.quantity cm3/ 1000H.: 81,5...82,5 cm3/: 3,5 Dispersion 1000H.: (4,0) Low-idle speed regulation: Speed
Del.quantity cm3/
1000H.: 21.5...25.5
Dispersion cm3/: 3.5 1/min: 350 Speed 1000H.: (4,0) Full-load speed regulation: 1/min: 1200 Speed Deliquantity cm3/ 1000H: 12,0...18,0 Start: 1/min: 100 Speed Del.quantity mind. cm3/1000H.: 100 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 400 1st speed mm: 1,7...2,5 mm: (1,4...2,8) 1/min: 800 TD travel 2nd speed TD travel mm: mm: (4,3...5,7) 1/min: 1050 3rd speed mm: 5,4...6,2 mm: (5,1...6,5) TD travel Supply-pump pressure characteristic: 1/min: 400 1st speed Supply-pump bar: 3,5...4,1 pressure 1/min: 1050 2nd speed Supply-pump pressure bar: 6,0...6,6 Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 55...138 cm3/10s: (40...153) quantity 1/min: 1090 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153)

Full-load del. w/out charge press.:

Speed

Supply-pump pressure:

1/min: 800

Setting value bar: 5,1...5,7

```
Delivery-quant. and breakaway char.:
1st speed
              1/min: 1270
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed
               1/min: 1200
Del.quantity cm3/: -
1000H.: (10,5...19,5)
               1/min: 1150
4th speed
              cm3/: 47,0...53,0
1000H.: (45,5...54,5)
Del.quantity
               1/min: 1050
Del.quantity cm3/: 78,5...81,5
1000H.: (77,4...82,6)
5th speed
               1/min: 800
6th speed
Del.quantity cm3/: -
1000H.: (79,4...84,6)
               1/min: 650
7th speed
Del.quantity cm3/: 75.0...79.0
1000H.: (73.6...80.4)
8th speed
               1/min: 500
               cm3/: 65,5...69,5
Del.quantity
               1000H: (64,1...70,9)
Zero delivery (stop):
1000H.
Idle delivery:
               1/min: 350
1st speed
Del.quantity cm3/: -
              1000H.: (19,0..28,0)
2nd speed
               1/min: 400
Del.quantity cm3/: 4,5...10,5
1000H.: (3,0...12,0)
               1/min: 460
3rd speed
Del.quantity cms/: 1000H.: 0...2,0
Automatic starting fuel delivery:
               1/min: 220
1st speed
Del.quantity cm3/: -
 ind.
               1000H: 100,0
2nd speed
               1/min: 300
Del.quantity cm3/: -
               1000H: 70,0
 ax.
Shutoff electromagnet:
Cut-in
 min. voltage
Rated voltage
Mounting and assembly dimensions:
Designation
                mm
KF
                    : 5,1...5,4
                mm
```

A06

MS mm : 1,0..1,25 SVS max. mm : 3,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3.1 C Edition : 3.12.86 replaces : 4.86 Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 L217 Type number : 0 460 414 027

Customer-specific information Customer : VOLVO PENTA

Engine : TAMD 31

Power k: 95

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value bar: 6,1...6,7

```
Supply-pump
                                                                              bar: 2,7...3,3
1/min: 1900
Full-load del. with charge press.:
                                                               pressure
                                                              2nd speed
Speed
                1/min: 1500
                                                                                hPa: 1000
                                                              Charge press.
Charge press. hPa: 1000
                                                              Supp Ty-pump
Del.quantity
                                                                                bar: 7,5...8,1
                cm3/
                                                               pressure
               1000H.: 93,5...94,5
                cm3/:5,0
Dispersion
                                                              Overflow quantity at overflow valve:
               1000H : -
                                                                              1/min: 700
                                                              1st speed
Full-load del. w/out charge press.:
                                                              Charge press. hPa: -
                                                              Oveflow
                                                                                    : 46...83
                                                               quantity cm3/10s: (21...98)
Speed
               1/min : 650
Del.quantity cm3/
                                                              2nd speed
                                                                          1/min: 1900
               1000H.: 58,5...59,5
                                                              Charge press. hPa: 1000
                                                                                    : 55...138
                                                              Overflow
Low-idle speed regulation:
                                                               quantity cm3/10s: (40...153)
Speed
                1/min: 350
                                                              Delivery-quant. and breakaway char.:
                                                                             1/min: 800
Charge press. hPa: -
                                                              1st speed
Del.quantity
                                                              Charge-air pressure-setting
                cm3/
               1000H.: 23,0...27,0 cm3/: 3,5
                                                               point
                                                                                hPa: 300
                                                             LDA stroke mm: 6,4
Del.quantity cm3/: 83,5...84,5
1009H.: (81,3...86,7)
Dispersion
               1000H.: -
Full-load speed regulation:
                                                                              1/min: 2230
                                                              2nd speed
                                                              Charge press. hPa: 1000
                1/min: 2100
Speed
                                                             Del.quantity cm3/: -
1000H.: 0...3,0
Charge press. hPa: 1000
Deliquantity cm3/
                1000H: 31,0...37,0
                                                                              1/min: 2100
                                                              3rd speed
                                                              Charge press. hPa: 1000
                                                             Del.quantity cm3/: -
1000H.: (29,5...38,5)
Start:
                                                                              1/min: 2050
Speed
                1/min: 100
                                                              4th speed
                                                             Charge press. hPa: 1000
Del.quantity cm3/: 67,0...77,0
1000H.: (67,5...76,5)
Sth speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm3/: 83,0...86,0
1000H.: (81,8...87,2)
Del.quantity mind.
          cm3/1000H.: 100
Inspection-pump test specifications
Test specifications in parentheses
                                                                              1/min: 1500
Timing-device characteristic:
                                                              6th speed
                                                             Charge press. hPa: 1000
                                                             The speed 1/min: 1000

Del.quantity cm3/: -
1000H.: (91,3...96,7)

7th speed 1/min: 1200

Charge press. hPa: 1000

Del.quantity cm3/: 97,2...99,8
1000H.: (95,8...101,2)

8th speed 1/min: 700

Charge press. hPa: 1000
                1/min: 1100
1st speed
Charge press. hPa: 1000
                    mm: 0,9...1,7
TD travel
                mm: (0,6...2,0)
1/min: 1500
2nd speed
Charge press. hPa: 1000
TD travel
                    mm: -
                    mm: (3,8...5,2)
                                                             Charge press. hPa: 1000
                                                             Del.quantity cm3/: 96,5...99,5
1000H: (94,6...101,4)
                1/min: 1900
3rd speed
Charge press. hPa: 1000
                    mm: 6,1...6,9
mm: (5,8...7,2)
TD travel
                                                                              1/min: 650
                                                             9th speed
                                                             Charge press. hPa:
                                                             Del.quantity cm3/:
                                                                              1000H: (56,3...61,7)
Supply-pump pressure characteristic:
1st speed
                1/min: 500
                                                             Zero delivery (stop):
Charge press. hPa: 1000
```

80A

```
Mech. shutoff:
Speed
               1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 1090
volt: 12,0
Speed
ELAB
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: 1000H.:
                       (20,5..29,5)
2nd speed
               1/min: 400
Del.quantity cm3/: 7.0...13.0
1000H.: (5.5...14.5)
3rd speed 1/mir: 480
Del.quantity cm3/: -
1000H.: 0...3,0
Automatic starting fuel delivery:
1st speed
               1/min: 400
Del.quantity cm3/: -
 ind.
               1000H: 74,0
2nd speed
               1/min: 500
               cm3/: -
Del.quantity
               1000H: 72.0
Shutoff electromagnet:
Cut-in
                     : 10,0
 min. voltage
                     : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                mm
KF
                     : 5,2...5,5
                mm
MS
                     : 1,2...1,4
                mm
                    : 3,8
SVS max.
                mm
                    : 18,8...20,8
: 14,3...17,7
ΧK
                mm
XL
                mm
Remarks:
Pushing electromagnet.
Correction at adjusting nut (46)
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A1 : 4.12.86 Edition replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L217-2

: 0 460 414 031 Type number

Customer-specific information Customer : VOLVO PENTA

: TAM 31 Engine

Power k: 31

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter x Wall thickness : 2 mm : 450 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device trave:

Speed 1/min: 1500 Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1500 Setting value bar: 6,1...6,7

Full-load del. w/out charge press.:

1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Delivery-quant, and breakaway char.:
Speed 1/min: 1500	1st speed 1/min: 1970
Del.quantity cm3/ 1000H.: 83,584,5	Del.quantity cm3/: - 1000H.: 03,0
Dispersion cm3/: 5,0	3rd speed 1/min: 1880
1000H.: -	
	Del.quantity cm3/: 3.011.0 1000H.: (2.511.5)
Low-idle speed regulation:	4th speed 1/min: 1800
Speed 1/min: 350	Del.quantity cm3/: - 1000H.: (29,538,5)
Del.quantity cm3/	5th speed 1/min: 1750
1000H.: 18,022,0	Del.quantity cm3/: 53.061.0
Dispersion cm3/: 3,5	Del.quantity cm3/: 53.061.0 1000H.: (52.561.5)
1000H.: -	oth speed 1/min: 1625
Full-load speed regulation:	Del.quantity cm3/: 78,581,5
Speed 1/min: 1800	1000H.: (77,382,7) 7th speed 1/min: 1500
Del.quantity cm3/	Del.quantity cm3/: -
1000H: 31,037,0	1000H.: (81,386,7)
1	8th speed 1/min: 1000
Start:	Del.quantity cm3/: 91,794,3
Speed 1/min: 100	1000H: (90,395,7) 9th speed 1/min: 800
Del.quantity mind.	Del.quantity cm3/: 90,093,0
cm3/1000H.: 95,0	1000H: (88,194,9)
Inspection-pump test specifications	Zero delivery (stop):
Test specifications in parentheses	Mech. shutoff:
	Speed 1/min: -
Timing-device characteristic:	Del.quantity cm3/: -
	1000H.
1st speed	
TD travel mm: 0,91,7	Electr. shutoff:
mm: (0,62,0) 2nd speed 1/min: 1500	Speed 1/min: 1625 ELAB volt: 12,0
TD travel mm: -	Del.quantity cm3/: -
mm: (3,85,2)	1000H.
3rd speed 1/min: 1625	
TD travel mm: 5,05,8	Idle delivery:
mm: $(4,76,1)$	1st speed 1/min: 350
Supply-pump pressure characteristic:	1st speed
	1000H.: (15,524,5)
1st speed 1/min: 500	2nd speed 1/min: 400
Supply-pump 1	Del.quantity cm3/: 4,010,0
pressure bar: 2,73,3	1000H.: (2,511,5) 3rd speed 1/min: 450
2nd speed 1/min: 1625 Supply-pump	3rd speed
pressure bar: 6,67,2	1000H.: 03,0
Overflow quantity at overflow valve:	2nd speed 1/min: 600
1st seed 1/nin 700	Del.quantity cm3/: -
1st speed	ax. 1000H: 90,0
quantity cm3/10s: (2198)	Shutoff electromagnet:
2nd speed 1/min: 1625	
Overflow : 55138 I	Cut-in
quantity cm3/10s: (40153)	min. voltage : 10,0
1	Rated voltage : 12,0
A11	

Mounting and assembly dimensions:

Designation K KF MS SVS max. XK XL

mm : -mm : K-0T mm : 1,2..1,45 mm : 1,2 mm : 18,8...20,8 mm : 11,1...14,5

Remarks: Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Full-load del. with charge press.: Note inst. in remarks column Speed 1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 72,0...73,0 : VOL 3,1 A Test sheet Edition : 4.12.86 cm3/ 5,0 1000H -: 4.86 replaces Dispersion : ISO 4113 Calibrating oil Injection pump : VE 4/11F1900 L217-3 Full-load del. w/out charge press.: : 0 460 414 032 Type number 1/min : 650 Speed Del.quantity cm3/ Customer-specific information : VOLVO PENTA 1000Ha: 54,0...55,0 : TMD 31 Low-idle speed regulation: Engine k: 74 Power Speed 1/min: 350 Charge press. hPa: -Del.quantity cm3/ 1000H.: 18,0...22,0 TEST BENCH REQUIREMENTS Calibrating-oil C Full-load speed regulation: return temp. with thermometer: 40...48 1/min: 2150 Speed Charge press. hPa: 1000 : 42...50 electronically Del.quantity cm3/ 1000H: 12,0...18,0 Inlet press., bar: 0.2 Calibrating nozzle-holder Start: : 1 688 901 022 assembly Speed 1/min: 100 Del.quantity mind. Opening bar: 130...133 cm3/1000H.: 90.0 pressure Inspection-pump test specifications Test inj. tubing : 1 688 750 073 Test specifications in parentheses Outside diameter x Wall thickness : 2 Timing-device characteristic: mm: 450 x Length 1st speed 1/min: 1000 Charge press. hPa: 1000 Start of delivery mm: 0,3 TD travel mm: 1,5...2,3 Prestroke (from BDC): +-0.02(0.04)mm: (1,2...2,6)1/min: 1500 2nd speed Charge press. hPa: 1000 Injection-pump setting values Test specifications in parentheses TD travel mm: mm: (4,8...6,2) 1/min: 1900 hPa: 1000 Timing-device travel: 3rd speed Charge press. mm: 6,3...7,1 mm: (6,0...7,4) 1/min: 1500 TD travel Speed Charge press. hPa: 1000 Setting value mm: 5,3...5,7 Supply-pump pressure characteristic: Supply-pump pressure: 1/min: 500 1st speed hPa: 1000 1/min: 1500 Speed Charge press. Charge press. hPa: 1000 Supply-pump bar: 2,9...3,5 Setting value bar: 6,4...7,0 pressure

A13

1/min: 1900 2nd speed volt: 12,0 Supply-pump Del.quantity cm3/: bar: 7,7...8,3 1000H. pressure Overflow quantity at overflow valve: Idle delivery: 1st speed 1/min: 700 1/min: 350 1st speed Charge press. hPa: -Del.quantity cm3/: -1000H.: (15,5..24,5) Oveflow : 41...83 quantity cm3/10s: (26...98) 2nd speed 1/min: 400 Del.quantity cm3/: 4,5...10,5 1000H.: (3,0...12,0) 2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55... 55...138 1/min: 450 3rd speed quantity cm3/10s: (40...153) Del.quantity cm3/: 1000H.: 0...3,0 Delivery-quant, and breakaway char.: 1st speed Automatic starting fuel delivery: 1/min: 800 Charge-air pressure-setting point hPa: 300 1/min: 400 1st speed LDA stroke mm: 6,3
Del.quantity cm3/: 67,5...68,5
1000H.: (65,4...70,6)
2nd speed 1/min: 2220 cm3/: Del.quantity 1000H: 70,0 ind. 1/min: 500 2nd speed Charge press. hPa: 1000 Del.quantity cm3/: -Del.quantity cm3/: -1000H.: 0...3,0 1000H: 65,0 1/min: 2150 3rd speed Shutoff electromagnet: Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: (10,5...19,5) 4th speed 1/min: 2100 Cut-in : 10,0 min. voltage : 12,0 Rated voltage Charge press. hPa: 1000 Del.quantity cm3/: 50.5...60.5 1000H.: (51.0...60.0) Mounting and assembly dimensions: 1/min: 1900 5th speed Designation Charge press. hPa: 1000
Del.quantity cm3/: 67,5...70,5
1000H.: (66,4...71,6)
6th speed 1/min: 1500 mm KF : 5,2...5,5 mm MS : 1,2...1,4 mm : 3,8 SVS max. mm Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: (69,9...75,1) Remarks: Pushing electromagnet. 1/min: 800 7th speed Charge press. hPa: 1000 Del.quantity cm3/: 73,0...76,0 1000H.: (71,1...77,9) 1/min: 650 8th speed Correction at adjusting nut (46) Charge press. hPa: -Deliquantity cm3/: 1000H: (51,9...57,1) Zero delivery (stop): Mech. shutoff: 1/min: -Speed Del.quantity cm3/: - 1000H. Electr. shutoff: 1/min: 1900 Speed A14

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : VOL 3_0 P1 Test sheet Edition : 2.12.86 replaces : ISO 4113 Calibrating oil Injection pump : VE 4/11F1625 L111-3 Type number : 0 460 414 033 Customer-specific information Customer : VOLVO-PENTA Engine : TAMD 30 A TEST BENCH REQUIREMENTS Calibrating-oil return temp. °C With thermometer : 40...48 : 42...50 electronically Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 000 assembly Opening bar : 147...150 pressure Test inj. tubing : 1 680 750 017 Outside diameter x Wall thickness mm: 840 x Length Start of delivery Prestroke mm: 0,2 (from BDC): +-0.02(0.04)Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1500 Setting value mm: 2,6...3,0 Supply-pump pressure: 1/min: 1500 Speed Setting value bar: 6,2...6,8 Full-load del. w/out charge press.: Speed 1/min : 1500

Del.quantity cm3/ 1000H.: 62,0...63,0 cm3/: 3,5 Dispersion 1000H .: -Low-idle speed regulation: 1/min: 325 Del.quantity cm3/ 1000H.: 26,0...30,0 cm3/: 3,5 Dispersion 1000H.: -Full-load speed regulation: Speed 1/min: 2000 Del.quantity cm3/ 1000H: 6,0...14,0 Start: Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 70.0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 1000 1st speed mm: 0,5...1,3 TD travel mm: (0,2...1,6)1/min: 1500 2nd speed TD travel mm: mm: (2,1...3,5) 1/min: 1625 3rd speed mm: 3,0...3,6 mm: (2,6...4,0) TD travel Supply-pump pressure characteristic: 1/min: 600 1st speed Supply-pump bar: 3,2...3,8 pressure 1/min: 1625 2nd speed Supply-pump bar: 6,6...7,2 pressure Overflow quantity at overflow valve: 1/min: 600 1st speed veflow : 55...138 quantity cm3/10s: (40...153) and speed 1/min: 1625 Oveflow 2nd speed Over flow : 55...138 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2100

```
Del.quantity cm3/: -
               1000H.: 0...2,0
2nd speed
                1/min: 2000
Del.quantity cm3/: -
               1000H.: (5,5...14,5)
1/min: 1800
3rd speed
Del.quantity cm3/: 46.5...52.5

1000H.: (45.0...54.0)

4th speed 1/min: 1625

Del.quantity cm3/: 58.5...61.5

1000H.: (57.3...62.7)
                1/min: 1500
5th speed
Del.quantity cm3/: -
1000H.: (59,8...65,2)
                1/min: 1000
6th speed
Del.quantity cm3/: 61.5...63.5
1000H.: (59.8...65.2)
               1/min: 600
7th speed
Del.quantity cm3/: 52,5...56,5
1000H.: (51,1...57,9)
Zero delivery (stop):
               1000H.
Idle delivery:
1st speed
                1/min: 325
Del.quantity cm3/: -
               1000H.: (23,5..32,5)
2nd speed
                1/min: 450
Del.quantity cm3/: -
1000H.: 0...3,0
                1/min: 500
3rd speed
Del.quantity cm3/: -
1000H.: 0...1,0
Automatic starting fuel delivery:
1st speed
                1/min: 350
Del.quantity cm3/: -
                1000H: 70,0
 ind.
2nd speed
                1/min: 450
Del.quantity cm3/: -
                1000H: 65,0
 ax.
Shutoff electromagnet:
Cut-in
                      : 20,0
 min. voltage
Rated voltage
                      : 24,0
Mounting and assembly dimensions:
Designation
K
                 mm
KF
                 mm : 5,7...6,0
MS
                     45,1,2,1
                 mm
SVS max.
                      : 5,0
                 mm
```

Remarks: Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS 1/min : 1500 Speed Del.quantity cm3/ Note inst. in remarks column 1000H.: 83,5...84,5 cm3/: 5,0 Dispersion : VOL 3_1 A2 Test sheet 1000H.: -Edition : 4.12.86 replaces Low-idle speed regulation: Calibrating oil : ISO 4113 1/min: 350 Injection pump Del.quantity cm3/ 1000H.: 18.0...22.0 Dispersion cm3/: 3,5 : VE 4/11F1625 L217-4 : 0 460 414 034 Type number Customer-specific information 1000H .: -Customer : VOLVO PENTA Full-load speed regulation: Engine : TAM 31 Speed 1/min: 1800 Del.quantity cm3/ Power k: 81 1000H: 31,0...37,0 TEST BENCH REQUIREMENTS Start: Calibrating-oil C Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 95.0 with thermometer : 40...48 electronically : 42...50 Inspection-pump test specifications Test specifications in parentheses Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 022 assembly Timing-device characteristic: Opening 1/min: 1100 1st speed pressure bar : 130...133 TD travel mm: 0,9...1,7 mm: (0,6...2,0) 1/min: 1500 2nd speed Test inj. tubing : 1 680 750 073 TD travel mm: mm: (3,8...5,2) 1/min: 1625 Outside diameter : 6 3rd speed mm: 5,0...5,8 x Wall thickness : 2 TD travel mm: 450 mm: (4,7...6,1)x Length Start of delivery Supply-pump pressure characteristic: mm: 0.3 Prestroke (from BDC): +-0.02(0.04)1/min: 500 1st speed Supply-pump bar: 2,7...3,3 1/min: 1625 Injection-pump setting values pressure Test specifications in parentheses 2nd speed Supply-pump Timing-device travel: bar: 6,6...7,2 pressure 1/min: 1500 Overflow quantity at overflow valve: Setting value mm: 4,3...4,7 1/min: 700 1st speed Supply-pump pressure: Oveflow : 41...83 cm3/10s: (26...98) 1/min: 1625 quantity Speed 1/min: 1500 2nd speed Over flow : 55.,.138 Setting value bar: 6,1...6,7 quantity cm3/10s: (40...153) Full-load del. w/out charge press.:

A17

```
Delivery-quant. and breakaway char.:
1st speed
              1/min: 1970
Del.quantity cm3/: -
              1000H.: 0...3,0
2nd speed
               1/min: 1880
Del.quantity cm3/: 3.0...10.0
1000H.: (2,5...11,5)
               1/min: 1800
3rd speed
Del.quantity cm3/: -
1000H.: (29,5...38,5)
4th speed 1/min: 1750
Del.quantity cm3/: 53,0...61,0
             1000H.: (52,5...61,5)
5th speed
              1/min: 1625
Del.quantity cm3/: 78,5...81,5
1000H.: (77,3...82,7)
              1/min: 1500
6th speed
Del.quantity cm3/: -
1000H.: (81,3...86,7)
              1/min: 1000
7th speed
Del.quantity cm3/: 91,7...94,3
              1000H.: (90,3...95,7)
8th speed
               1/min: 800
Del.quantity cm3/: 90,0...93,0
              1000H: (88,1...94,9)
Zero delivery (stop):
              1000H.
Idle delivery:
              1/min: 350
1st speed
Del.quantity cm3/:
             1000H.:
                      (15, 19, 5)
2nd speed
              1/min: 400
Del.quantity cm3/: 4,0...10,0
             1000H.: (2,5...11,5)
              1/min: 450
3rd speed
Del.quantity cm3/: -
1000H.: 0...3,0
2nd speed
              1/min: 600
Del.quantity cm3/: -
               1000H: 90-0
Shutoff electromagnet:
Cut-in
                    : 20,0
 min. voltage
Rated voltage
                    : 24,0
Mounting and assembly dimensions:
Designation
K
               mm
KF
                    : K-2T
               mm
                   : 1,2..1,45
: 18,8...20,8
MS
               mm
XK
               mm
XL
               mm
                    5,11,1...14
```

Remarks: Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Full-load del. with charge press.: Note inst. in remarks column Speed 1/min: 1100 Charge press. hPa: 800 Del.quantity cm3/ 1000H.: 60_5...61,5 Test sheet : VOL 3,1 E Edition : 3.12.86 replaces cm3/: 3,5 Dispersion Calibrating oil : ISO 4113 Injection pump : VE 4/11F1300 L251 Full-load del. w/out charge press.: Type number : 0 460 414 037 Speed 1/min : 600 Customer-specific information Del.quantity cm3/ Customer : VOLVO-PENTA 1000H.: 47,0...48,0 Engine : TD 31 Low-idle speed regulation: Power k: 49 Speed 1/min: 350 Charge press. hPa: -TEST BENCH REQUIREMENTS Del.quantity cm3/ 1000H.: 18,0...22,0 Calibrating-oil cm3/: 3,5 Dispersion 1000H.: return temp. with thermometer : 40...48 Full-load speed regulation: electronically : 42...50 1/min: 1350 Speed Inlet press., bar : 0.2 Charge press. hPa: 800 Del.quantity cm3/ Calibrating nozzle-holder 1000H: 28,0...34,0 : 1 688 901 022 assembly Start: Opening pressure bar : 130...133 1/min: 100 Speed Del.quantity mind. cm3/1000H.: 70.0 Test inj. tubing : 1 6800 750 073 Inspection-pump test specifications Outside diameter Test specifications in parentheses x Wall thickness : 2 mm: 450 x Length Timing-device characteristic: Start of delivery Prestroke mm: 0,2 1/min: 900 1st speed (from BDC): +-0.02(0.04)Charge press. hPa: 800 TD travel mm: 0,2...1,0 Injection-pump setting values mm: (0...1,3)1/min: 1100 Test specifications in parentheses 2nd speed Charge press. hPa: 800 TD travel Timing-device travel: mm: mm: (0,9...2,3) 1/min: 1300 1/min: 1100 Speed 3rd speed Charge press. hPa: 800 Charge press. hPa: 800 mm: 2,3...3,1 mm: (2,0...3,4) Setting value mm: 1,4...1,8 TD travel Supply-pump pressure: Supply-pump pressure characteristic: 1/min: 1100 Speed Charge press. hPa: 800 Setting value bar: 4,8...5,4 1/min: 500 1st speed Charge press. hPa: 800 A19

Supply-pump Idle delivery: bar: 2,4...3,0 1/min: 1300 pressure 2nd speed 1/min: 350 1st speed 1/min. 330
Del.quantity cm3/: 1000H.: (15,5..24,5)
2nd speed 1/min: 380
Del.quantity cm3/: 5,0...11,0
1000H.: (3,5...12,5) 1st speed Charge press. hPa: 800 Supp Ty-pump bar: 5,6...6,2 pressure Overflow quantity at overflow valve: 1/min: 420 3rd speed Del.quantity cm5/: -1000H.: 0...3,0 1/min: 600 1st speed Charge press. hPa: 800 Oveflow : 41...83 quantity cm3/10s: (26...98) 2nd speed 1/min: 1300 Automatic starting fuel delivery: Charge press. hPa: 800 Overflow : 55. 1st speed 1/min: 250 Del, quantity : 55...138 cm3/: quantity cm3/10s: (40...153) 1000H: 70.0 ind. Delivery-quant. and breakaway char.: 1/min: 450 2nd speed 1st speed 1/min: 600 Del.quantity cm3/: -1000H: 52,0 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 47,0...48,0 Shutoff electromagnet: 1000H.: (44,8...50,2) 2nd speed 1/min: 1450 Charge press. hPa: 800 Cut-in min. voltage Del.quantity cm3/: -Rated voltage 1000H.: 0...2,5 3rd speed 1/min: 1400 Mounting and assembly dimensions: Charge press. hPa: 800 Del.quantity cm3/: 9.0...16.0 1000H.: (8.0...17.0) 4th speed 1/min: 1350 Charge press. hPa: 800 Designation mm : 5,7...6,0 : 1,2..1,45 **KF** mm MS mm Deliquantity cm3/: -SVS max. mm 1000H.: (26,5...35,5) 1/min: 1250 5th speed Remarks: Charge press. hPa: 800 Correction at adjusting nut (46) Del.quantity cm3/: 60,5...63,5 1000H.: (59,3...64,7) 6th speed 1/min: 1100 Charge press. hPa: 800 Del.quantity cm3/: -1000H.: (58,3...63,7) Pushing electromagnet. 7th speed 1/min: 600 Charge press. hPa: 800 Del.quantity cm3/: 50,0...53,0 1000H.: (48,1...54,9) 1/min: 600 8th speed Charge press. hPa: -Del.quantity cm3/: -1000H: (38,3...43,7) Zero delivery (stop): Mech. shutoff: 1/min: 1300 Speed Del.quantity cm3/: - 1000H.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : FIA 3,6 K Edition : 18,12,86 replaces Calibrating oil : ISO 4113 : VE 4/11F1350 R257 Injection pump : 0 460 414 039 Type number Customer-specific information Customer : FIAT-IVECO Engine : 8040.25.200 TEST BENCH REQUIREMENTS Calibrating-oil C return temp. with thermometer : 40...48 : 42...50 electronically Inlet press., bar : 0.2 Calibrating nozzle-holder : 1 688 901 020 assembly Opening. bar: 172...175 pressure Perforated-plate diameter mm : 0.6Test inj. tubing : 1 680 750 017 Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length Start of delivery Prestroke mm : 0,4(from BDC): +-0.02(0.04)Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1000 Speed Charge press. hPa: 1000 Setting value mm: 3,8...4,2 Supply-pump pressure:

1/min: 1000

Charge press. hPa: 1000

Setting value bar: 5,7...6,3 Full-load del. with charge press.: 1/min: 1000 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 93.5...94.5 Dispersion cm3/: 3.5 1000H : (4,0) Full-load del. w/out charge press.: 1/min : 500 Speed Del.quantity cm3/ 1000H.: 68,5...69,5 Low-idle speed regulation: 1/min: 400 Speed Charge press. hPa: -Del. quantity cm3/ 1000H.: 19.0...23.0 Dispersion cm3/: 3.5 1000H.: (4.0) Full-load speed regulation: 1/min: 1350 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 85,0...88,0 Start: 1/min: 100 Speed Deliquantity mind. cm3/1000H.: 90.0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 800 Charge press. hPa: 1000 mm: 1.7...2.5 mm: (1.4...2.8) TD travel 1/min: 1000 2nd speed Charge press. hPa: 1000 TD travel mm: mm: (3,3...3,7) 1/min: 1350 3rd speed Charge press. hPa: 1000 mm: 6,3...7,1 mm: (6,0...7,4) TD travel Supply-pump pressure characteristic: 1st speed 1/min: 500

Charge press. hPa: 1000 Mech. shutoff: Supply-pump 1/min: 1350 Speed bar: 3,6...4,2 pressure Del.quantity cm3/: -2nd speed 1000H. 1/min: 800 Charge press. hPa: 1000 Supply-pump Idle delivery: bar: 4,8...5,4 1/min: 1350 pressure 3rd speed 1st speed 1/min: 400 hPa: 1000 Charge press. Del.quantity cm3/: 1000H.: (16,5..25,5) Supply-pump bar: 7,0...7,6 2nd speed 1/min: 430
Del.quantity cm3/: 2,5...9,5
1000H.: (1,5...10,5) pressure Overflow quantity at overflow valve: 1/min: 480 3rd speed 1st speed 1/min: 500 Del.quantity cm3/: -1000H.: 0...2,5 Charge press. hPa: -Oveflow : 41...83 quantity cm3/10s: (26...98) Automatic starting fuel delivery: 2nd speed 1/min: 1350 Charge press. hPa: 1000 1st speed 1/min: 150 Overflow : 55...138 cm3/: Del.quantity quantity cm3/10s: (40...153) ind. 1000H: 90_0 Delivery-quant. and breakaway char.: 1/min: 230 2nd speed 1st speed 1/min: 500 Del.quantity cm3/: -Charge-air pressure-setting 1000H: 60,0 ax. point hPa: 250 Del.quantity cm3/: 76,5...77,5 1000H: (74,4...79,6) 2nd speed 1/min: 1600 Charge press. hPa: 1000 Shutoff electromagnet: Cut-in min. voltage : 20,0 Del.quantity cm3/: -1000H.: 0...2,5 : 24,0 Rated voltage 3rd speed 1/min: 1500 Mounting and assembly dimensions: Charge press. hPa: 1000 Del.quantity cm3/: 16.0...22.0 1000H.: (14.5...23.5) 4th speed 1/min: 1400 Charge press. hPa: 1000 Designation mm : 5,2...5,5 : 1,3..1,55 **KF** mm MS mm Del.quantity cm3/: 68,0...76,0 1000H.: (67,5...76,5) : 5,6 : 17,0...19,0 SVS max. mm XK mm 1/min: 1350 : 14,2...17,6 5th speed XL mm hPa: 1000 Charge press. Del.quantity cm3/: 1000H.: (82,0...91,0)
6th speed 1/min: 1000
Charge press. hPa: 1000 Remarks: Correction at adjusting nut (46) Del.quantity cm3/: -1000H.: (91,4...96,6) 7th speed 1/min: 500 Charge press. hPa: 1000 Del.quantity cm3/: 82,0...85,0 1000H.: (80,9...86,1) 1/min: 500 8th speed Charge press. hPa: Del.quantity cm3/: 1000H: (66,4...71,6) Zero delivery (stop):

Full-load del. w/out charge press.: BOSCH-INJ.-PUMP TEST SPECIFICATIONS 1/min : 1000 Del.quantity cm3/ Note inst. in remarks column 1000H.: 55.0...56.0 cm3/: 3,5 : FIA 3,6K1 Test sheet Dispersion Edition : 18.12.86 1000H.: (4,0) replaces Calibrating oil : ISO 4113 Low-idle speed regulation: : VE 4/11F1500 R264 Injection pump Speed Del.quantity cm3/ 1000H.: 7,0...11,0 Speed 1/min: 325 Type number : 0 460 414 040 Customer-specific information cm3/: 3,5 Dispersion Customer : FIAT-IVECO 1000H.: (4,0) Full-load speed regulation: Engine : 8040.05.200 1/min: 1600 Speed TEST BENCH REQUIREMENTS Del.quantity cm3/ 1000H: 38,0...44,C Calibrating-oil return temp. Start: with thermometer : 40...48 electronically : 42...50 Speed 1/min: 100 Del.quantity mind. Inlet press., bar: 0.2 cm3/1000H.: 65.0 Calibrating nozzle-holder Inspection-pump test specifications : 1 688 901 020 Test specifications in parentheses assembly Opening bar: 172...175 pressure Timing-device characteristic: Perforated-plate 1st speed 1/min: 700 mm: 0.6...1.4 mm: (0.3...1.7) diameter mm : 0.6TD travel 2nd speed 1/min: 1000 Test inj. tubing : 1 680 750 017 TD travel mm: mm: (3,0...4,4)3rd speed Outside diameter 1/min: 1300 mm: 5,8...6,4 mm: (5,4...6,8) 1/min: 1500 x Wall thickness : 2 TD travel mm: 840 x Length 4th speed Start of delivery TD travel mm: 6,2...7,0 mm: (5,9...7,3) mm: 0,2 Prestroke (from BDC): +-0.02(0.04)Supply-pump pressure characteristic: Injection-pump setting values Test specifications in parentheses 1st speed 1/min: 700 Supply-pump bar: 3,3...3,9 1/min: 1500 Timing-device travel: pressure 2nd speed Supply-pump 1/min: 1000 Speed bar: 6,3...6,9 Setting value mm: 3,5...3,9 pressure Overflow quantity at overflow valve: Supply-pump pressure: 1/min: 1000 1st speed 1/min: 700 Speed Setting value bar: 4,5...5,1 Oveflow : 41...83 quantity cm3/10s: (26...98)

A23

```
1/min: 1500
: 55...138
2nd speed
Over flow
 quantity cm3/10s: (40...153)
Delivery-quant. and breakaway char.:
1st speed
                1/min: 1750
Del.quantity cm3/: -
               1000H.: 0...2,5
3rd speed 1/min: 1650
Del.quantity cm3/: 15.5...24.5
1000H.: (15.5...24.5)
4th speed 1/min: 1600
Del.quantity cm3/: 1600
Del.quantity cm3/: -
1000H.: (36,5...45,5)
5th speed
                 1/min: 1500
Del.quantity cm3/: 52,5...55,5
1000H.: (51,4...56,6)
6th speed 1/min: 1300
Del.quantity cm3/: 51.5...54.5
1000H.: (50.4...55.6)
                 1/min: 1000
7th speed
Del.quantity cm3/: -
1000H.: (52,9...58,1)
8th speed 1/min: 700
Del.quantity cm3/: 53,0...56,0
                 1000H: (51,1...57,9)
Zero delivery (stop):
Mech. shutoff:
                 1/min: 1500
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
                1/min: 325
Del.quantity cm3/: -
               1000H.: (4,5...13,5)
2nd speed
                 1/min: 360
Del.quantity cm3/: 1.5...7.5
1000H.: (0...9.0)
3rd speed
                1/min: 420
Del.quantity cms/: -
1000H.: 0...1,5
Automatic starting fuel delivery:
1st speed
                1/min: 150
Deliquantity cm3/: -
                1000H: 70,0
 ind.
2nd speed
                1/min: 230
Del.quantity cm3/: -
                1000H: 30,0
Shutoff electromagnet:
Cut-in
                       : 20,0
 min. voltage
```

Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

mm 🚉 : **KF** 5,2...5,5 mm : 1,8..2,05 MS mm SVS max. mm XK . 17,0...19,0 mm XL

mm

5, 13, 1... 16, 13

Remarks:

A24

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 K2 Edition replaces : 18.12.86

Calibrating oil : ISO 4113

Injection pump : VE 4/11F1350 R268

Type number : 0 460 414 043

Customer-specific information Sustomer : FIAT-IVECO

Engine : 8040.25R230

Power k: 74

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening

bar: 172...175 pressure

Perforated-plate

diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 0,4

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000 Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 1000

Setting value bar: 5,1...5,7 Overflow quantity at overflow valve: Full-load del. w/out charge press.: 1/min: 500 1st speed : 41...83 Oveflow Speed cm3/10s: (26...98) 1/min : 800 quantity Del.quantity cm3/ 2nd speed 1/min: 1350 1000H.: 82,5...83,5 cm3/: 3,5 Over flow : 55...138 Dispersion quantity cm3/10s: (40...153) 1000H.: (4.0) Delivery-quant, and breakaway char.: Low-idle speed regulation: 1st speed 1/min: 1600 Del.quantity cm3/: -1000H:: 0...2,5 Speed 1/min: 350 1/min: 1550 Del.quantity cm3/ 3rd speed Del.quantity cm3/: 1.5...9.5 1000H.: (1.0...10.0) 1000H.: 22,0...26,0 cm3/: 3,5 Dispersion 1000H.: (4,0) 1/min: 1500 4th speed Del.quantity_cm3/: -1000H.: (21,5...30,5) Full-load speed regulation: 1/min: 1500 Speed 5th speed Del.quantity cm3/: 72.0...75.0 1000H.: (70,9...76,1) Del.quantity cm3/ 1000H: 23,0...29,0 1/min: 1250 6th speed Del.quantity cm3/: 75,2...77,8 1000H.: (73,9...79,1) Start: Speed 1/min: 100 7th speed 1/min: 800 Del.quantity cm3/: -1000H.: (80,4...85,6) Del.quantity mind. cm3/1000H.: 90.0 1/min: 500 8th speed Del.quantity cm3/: 66,5...69,5 Inspection-pump test specifications 1000H: (64,6...71,4) Test specifications in parentheses Zero delivery (stop): 1000H. Timing-device characteristic: 1/min: 700 Idle delivery: 1st speed mm: 1,2...2,0 mm: (0,9...2,3) TD travel 1st speed 1/min: 350 Del.quantity cm3/: -1000H.: (19,5..28,5) 1/min: 1000 2nd speed TD travel mm: 2nd speed 1/min: 400 Del.quantity cm3/: 3,0...9,0 1000H.: (1,5...10,5) mm: (3,7...5,1) 1/min: 1200 3rd speed mm: 5,7...6,3 mm: (5,3...6,7) TD travel 1/min: 460 3rd speed 1/min: 1350 4th speed Del.quantity cm3/: -1000H.: 0...2,5 mm: 6,2...7,0 mm: (5,9...7,3) TD travel Automatic starting fuel delivery: Supply-pump pressure characteristic: 1/min: 150 1st speed 1/min: 500 cm3/: -1st speed Del.quantity 1000H: 90,0 Supply-pump bar: 3,1...3,7 1/min: 700 pressure 2nd speed 2nd speed 1/min: 230 Supply-pump cm3/: -Del.quantity bar: 4,0...4,6 1/min: 1350 1000H: 50.0 pressure ax. 3rd speed Supply-pump Shutoff electromagnet: bar: 6,6...7,2 pressure

Cut-in

min. voltage : 20,0 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation K
KF
MS
SVS max. mm mm : 5,2...5,5 mm : 1,3..1,55

mm : -

mm : 17,0...19,0 mm : 14,0...17,4 XK

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y1
Edition : 10.12.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/11F1150 R140-1 Type number : 0 460 414 049

Type (Idinber : 0 400 414 04

Customer-specific information Customer : IHC

Engine : DT 239/856

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 020

Opening pressure bar : 172...175

Perforated-plate diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840

Start of delivery

Prestroke mm: 0,2 (from BDC): +-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800 Charge press. hPa: 800

Setting value mm: 4,5...4,9

Supply-pump pressure:

Speed 1/min: 800 Charge press. hPa: 800

Setting value bar: 5,3...5,9 1/min: 400 1st speed Charge press. hPa: 800 Supply-pump Full-load del. with charge press.: bar: 3,7...4,3 1/min: 1150 pressure 1/min: 800 2nd speed Speed Charge press. hPa: 800 hPa: 800 Charge press. Del.quantity cm3/ 1000H.: 92,2...93,2 Dispersion cm3/: 3,5 Supply-pump pressure bar: 6,4...7,0 1000H : (4,0) Overflow quantity at overflow valve: Full-load del. w/out charge press.: 1st speed 1/min: 500 Charge press. hPa: -1/min : 500 Oveflow quantity cm3/10s: (40...153) Del.quantity cm3/ 2nd speed 1/min: 1150 1000H.: 75,5...77,5 Charge press. hPa: 800 Overflow : 55...138 Low-idte speed regulation: quantity cm3/10s: (40...153) Speed 1/min: 350 Delivery-quant. and breakaway char.: 1st speed 1/min: 800 Charge press. hPa: cm3/ Del.quantity 1000H.: 23.0...27.0 cm3/: 3,5 Charge-air pressure-setting hPa: 300 point Dispersion 1000H.: (4,0) LDA stroke mm: 4,9 Del.quantity cm3/: 86,4...90,4 1000H.: -Full-load speed regulation: 1/min: 1300 Speed 1/min: 1270 2nd speed Charge press. hPa: 800
Del.quantity cm3/: 1000H:: 0...2,5 Charge press. hPa: 800 Del.quantity cm3/ 1000H: 22,0...28,0 3rd speed 1/min: 1270 Charge press. hPa: 800
Del.quantity cm3/: 1000H.: 21,5...29,5))
4th speed 1/min: 1230 Start: Speed 1/min: 100 Charge press. hPa: -Charge press. hPa: 800
Del.quantity cm3/: 66.0...74.0
1000H.: (65.5...74.5) Del.quantity mind. cm3/1000H.: 100 1/min: 1130 Inspection sump test specifications 5th speed Charge press. hPa: 800 Test specifications in parentheses Del.quantity cm3/: 85,4...88,4 1000H.: (84,3...98,5) 1/min: 800 Timing sovice characteristic: 6th speed Charge press. hPa: 800
Del.quantity cm3/: 1000H: (90,1...95,3) 1/min: 400 1st speed Charge press. hPa: 800 1/min: 800 TD travel mm: 0,8...1,6 7th speed Charge press. hPa: 300 Del.quantity cm3/: mm: (0,5...1,9)2nd speed 1/min: 800 1000H.: (85,0...91,8) Charge press. hPa: 800 1/min: 500 TD travel mm: -8th speed Charge press. hPa: 230
Del.quantity cm3/: 83,5...84,5
1000H: (81,4...86,6) mm: (4,5...4,9) 1/min: 1150 3rd speed Charge press. hPa: 800 1/min: 500 mm: 5,3...6,0 mm: (5,0...6,3) 9th speed TD travel Charge press. hPa: -Del.quantity cm3/: -1000H: (73,9...79,1) Supply-pump pressure characteristic:

```
Zero delivery (stop):
Mech. shutoff:
               1/min: 1150
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: -
1000H.: (20,5..29,5)
               1/min: 400
2nd speed
Del.quantity cm3/: 5,0...11,0
1000H.: (3,5...12,5)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...3,0
Automatic starting fuel delivery:
               1/min: 220
1st speed
Del.quantity cm3/: -
               1000H: 100,0
 ind.
               1/min: 300
2nd speed
Del.quantity cm3/: -
               1000H: 80,0
 ax.
Shutoff electromagnet:
Cut-in
min. voltage
                     : 10,0
                     : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
K
KF
                mm
                     : 5,2...5,4
                mm
                     1,2...1,4
MS
                mm
                    : 5,0
SVS max.
                mm
                     : 20,2...22,2
: 12,3...15,7
XK
                mm
XL
                mm
Remarks:
Correction at adjusting nut (46)
```

BOSCH-INJPUMP TEST SPECIFICATIONS	Full-load del. w/out charge press.:
Note inst. in remarks column	Speed 1/min: 800 Del.quantity cm3/
Test sheet : IHC 3,9 Y7 Edition : 12.12.86 I replaces : -	1000H.: 81,582,5 Dispersion cm3/: 3,5 1000H.: (4,0)
Calibrating oil : ISO 4113	Low-idle speed regulation:
Injection pump : VE 4/11F1090 R176-1 Type number : 0 460 414 050	Speed 1/min: 350 Del.quantity cm3/ 1000H.: 21,525,5
Customer-specific information Customer : IHC	1000H.: (4,0)
Engine : D239-E833	Full-load speed regulation:
TEST BENCH REQUIREMENTS	Speed 1/min: 1200 Del.quantity cm3/
Calibrating-oil return temp. °C with thermometer : 4048 electronically : 4250	1000H: 12,018,0 Start: Speed 1/min: 100 Del.quantity mind.
Inlet press., bar : 0.2	cm3/1000H.: 100
Calibrating nozzle-holder assembly : 1 688 901 020	Inspection-pump test specifications Test specifications in parentheses
Opening pressure bar: 172175	Timing-device characteristic:
Perforated-plate diameter mm: 0.6	1st speed
Test inj. tubing : 1 680 750 017	2nd speed
Outside diameter : 6 x Wall thickness : 2 x Length mm : 840	3rd speed 1/min: 1050 TD travel mm: 5.46.2 mm: (5,16,5)
Start of delivery Prestroke mm: 0,2 (from BDC): +-0,02(0,04)	Supply-pump pressure characteristic: 1st speed
Injection-pump setting values Test specifications in parentheses	Supply-pump pressure bar: 3,54,1 2nd speed 1/min: 1050 Supply-pump
Timing-device travel:	pressure bar: 6,06,6
Speed 1/min: 800 Setting value mm: 4,85,2	Overflow quantity at overflow valve: 1st speed 1/min: 500
Supply-pump pressure:	1st speed
Sneed 1/min: 800 Setting value bar: 5,15,7	2nd speed 1/min: 1090 Overflow : 55138 quantity cm3/10s: (40153)

```
Pelivery-quant. and breakaway char.:
1st speed
              1/min: 1270
Del.quantity cm3/: -
              1000H.: 0...2,0
3rd speed
               1/min: 1200
Del.quantity cm3/: -
1000H.: (10,5...19,5)
              1/min: 1150
cm3/: 47,0...53,0
1000H.: (45,5...54,5)
4th speed
Del quantity
               1/min: 1050
5th speed
Del.quantity cm3/: 78,5...81,5
1000H.: (77,4...82,6)
               1/min: 800
6th speed
Del.quantity cm3/: - (79,4...84,6)
               1/min: 650
7th speed
              cm3/: 75,0...79,0
1000H.: (73,6...80,4)
Del, quantity
               1/min: 500
8th speed
               cm3/: 65,5...69,5
Del.quantity
               1000H: (64,1...70,9)
Zero delivery (stop):
Mech. shutoff:
               1/min: 1090
Speed
Del.quantity cm3/: -
              1000H.
Idle delivery:
               1/min: 350
1st speed
Del.quantity cm3/: 1000H.:
                       (19,0..28,0)
               1/min: 400
2nd speed
              cm3/: 4.5...10.5
1000H.: (3.0...12.0)
Del.quantity
               1/min: 460
3rd speed
Del.quantity cm3/: -
1000H.: 0...2,0
Automatic starting fuel delivery:
1st speed
               1/min: 220
Del.quantity cm3/: -
               1000H: 100,0
 ind.
               1/min: 300
2nd speed
Del.quantity
                cm3/:
               1000H: 70,0
 ax.
Shutoff electromagnet:
Cut-in
min. voltage
Rated voltage
```

Mounting and assembly dimensions:

B04

Designation K mm : KF mm : 5,1...5,4
MS mm : 1,0..1,25
SVS max. mm : 3,2

Remarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,4 B
Edition : 3.12.86
replaces : 4.84
Calibrating oil : ISO 4113

Injection pump : VE 5/11F1900 L179 Type number : 0 460 415 007

Customer-specific information Customer : MOTORI VM

Engine : HR 592 HTJ/9

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840

Start of delivery

Prestroke mm: 0,2

(from BDC): +-0.02(0.04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value bar: 4,7...5,3

Full-load del. with charge press.:

2nd speed 1/min: 1900 1/min: 1500 Charge press. hPa: 1000 Speed Charge press. hPa: 1000 Supply-pump bar: 6,0...6,6 Del.quantity cm3/ pressure 1000H:: 66,5...67,5 cm3/: 3,5 Dispersion Overflow quantity at overflow valve: 1000H : -1/min: 600 1st speed Full-load del. w/out charge press.: Charge press. hPa: -: 55...138 Oveflow | quantity cm3/10s: (40...153) 2nd speed 10min: 1900 Speed 1/min : 600 Del.quantity cm3/ 1000H.: 41,5...42,5 Charge press. hPa: 1000 : 55...138 Over flow quantity cm3/10s: (40...153) Low-idle speed regulation: Speed 1/min: 420 Delivery-quant. and breakaway char.: Charge press. hPa: -1st speed 1/min: 700 Del.quantity cm3/ 1000H.: 20,5...24,5 Dispersion cm3/: 3,5 Charge-air pressure-setting hPa: 300 point LDA stroke mm: 4.5 Del.quantity cm3/: 51.0...52.0 1000H.: (48.1...54.9) 1000H.: -Full-load speed regulation: 1/min: 2200 2nd speed Charge press. hPa: 1000 1/min: 2060 Speed Del.quantity cm3/: -1000H.: 0...3,0 Charge press. hPa: 1000 Del.quantity cm3/ 1/min: 2160 1000H: 36,0...42,0 3rd speed Charge press. hPa: 1000
Del.quantity cm3/: 2,0...8,0
1000H.: (0,5...9,5)
4th speed 1/min: 2060 Start: Speed 1/min: 100 Charge press. hPa: 1000
Del.quantity cm3/: 1000H.: (34,5...43,5)
Sth speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm3/: 59,0...62,0
1000H.: (57,8...63,2) Del.quantity mind. cm3/1000H.: 50,0 Inspection-pump test specifications Test specifications in parentheses 1/min: 1500 Timing-device characteristic: 6th speed Charge press. hPa: 1000 Del. quantity cm3/: -1000H.: (64,3...69,7) 1st speed 1/min: 1000 Charge press. hPa: 1000 mm: 1,5...2,3 mm: (1,2...2,6) 1/min: 1500 1/min: 600 TD travel 7th speed Charge press. hPa: -Det.quantity cm3/: -1000H.: (38,6...45,4) 2nd speed Charge press. hPa: 1000 TD travel mm: mm: (4,4...5,8)Zero delivery (stop); 1/min: 1900 3rd speed Charge press. hPa: 1000 Mech. shutoff: mm: 7.1...7,9 mm: (6,8...8,2) TD travel Speed 1/min: -Del.quantity cm3/: - 1000H. Supply-pump pressure characteristic: Electr. shutoff: Speed ELAB 1/min: 1900 1st speed 1/min: 600 volt: 12,0 hPa: 1000 Charge press. Del.quantity cm3/: - 1000H. Supply-pump bar: 1,7...2,3 pressure

B06

```
Idle delivery:
               1/min: 420
1st speed
Del.quantity cm3/: -
1000H.: (18,0..27,0)
               1/min: 500
2nd speed
Del.quantity cm3/: 14.0..20.0
1000H.: (12.5..21.5)
3rd speed 1/min: 650
Del.quantity cm3/: -
1000H.: 0...2,0
Automatic starting fuel delivery:
               1/min: 280
1st speed
Del.quantity cm3/: -
               1000H: 50,0
 ind.
2nd speed
               1/min: 380
Del.quantity cm3/: -
               1000H: 55,0
Shutoff electromagnet:
Cut-in
                     : 10,0
: 12,0
 min. voltage
Rated voltage
Mounting and assembly dimensions:
Designation
K
                 mm
                     5,9...6,1
: 0,9...1,1
: 3,2
KF
                mm
MS
                mm
SVS max.
                TEST.
Remarks:
Pushing electromagnet.
```

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : FIA 5.5 0 Test sheet : 16.12.86 Edition : 6.84 replaces : ISO 4113 Calibrating oil Injection pump : VE 6/11F1250 R181 : 0 460 416 036 Type number Customer-specific information Customer : 8065.06.200 Engine TEST BENCH REQUIREMENTS Calibrating-oil return temp. °C with thermometer : 40...48 : 42...50 electronically Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 020 assembly Opening bar: 172...175 pressure Perforated-plate diameter mm: 0.6 Test inj. tubing : 1 680 750 017 Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1000 Speed Setting value mm: 4,9...5,3 Supply-pump pressure: Speed 1/min: 1000 Setting value bar: 5,2...5,8 Full-load del. w/out charge press.: 1/min : 800 Speed

Del.quantity cm3/ 1000H.: 63,5...64,5 Dispersion cm3/: 3,5 1000H.: (4,0) Low-idle speed regulation: Speed 1/min: 325 Del.quantity cm3/ 1000H.: 8,0...12,0 cm3/: 3.5 1000H.: (4,0) Dispersion Full-load speed regulation: 1/min: 1350 Speed Del.quantity cm3/ 1000H: 33,0...39,0 Start: 1/min: 100 Speed Del.quantity mind. cm3/1000H.: 95.0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 600 TD travel mm: 0,7...1,5 mm: (0,4...1,8)1/min: 1000 2nd speed TD travel mm: · mm: (4,4...5,8) 1/min: 1250 mm: 5,4...6,2 mm: (5,1...6,5) 3rd speed TD travel Supply-pump pressure characteristic: 1/min: 500 1st speed Supply-pump bar: 3,1...3,7 1/min: 1250 pressure 2nd speed Supply-pump bar: 6,3...6,9 pressure Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 55...138 quantity cm3/10s: (40...153) 2nd speed 1/min: 1250 : 55..138 Over flow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 1450

```
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed
                 1/min: 1400
Del.quantity cm3/: 2,0...9,0
1000H.: (1,0...10,0)
                 1/min: 1350
4th speed
Ath speed Del.quantity cm3/: - 1000H.: (31,5...40,5)
Sth speed 1/min: 1250
Del.quantity cm3/: 53,0...56,0
1000H.: (51,9...57,1)
                 1/min: 800
6th speed
Del.quantity cm3/: -
1000H.: (61,4...66,6)
                 1/min: 500
7th speed
Del.quantity cm3/: 58,5...61,5
1000H.: (56,6...63,4)
Zero delivery (stop):
Mech. shutoff:
Speed
                 1/min: 1250
Del.quantity cm3/: - 1000H.
Idle delivery:
                  1/min: 325
1st speed
Del.quantity cm3/: -
1000H.: \5,5...14,5)
2nd speed
                 1/min: 360
Del.quantity cm3/: 2,0...8,0
1000H.: (0,5...9,5)
                 1/min: 400
3rd speed
Del.quantity cms/: -
1000H.: 0...3,0
Automatic starting fuel delivery:
1st speed
                 1/min: 150
Del.quantity cm3/: -
                  1000H: 95,0
  ind.
2nd speed
                 1/min: 250
Del.quantity cm3/: -
                 1000H: 60,0
 ax.
Shutoff electromagnet:
Cut-in
 min. voltage
                        : 10,0
Rated voltage
                        : 12,0
Mounting and assembly dimensions:
Designation
                        : 3,2...3,4
: 5,2...5,4
: 1,5...1,7
: 4,3
K
                   mm
KF
                   mm
MS
                   mm
SVS max.
                   mm
```

B09

XK mm : 25,0...27,0 XL mm : 13,4...16,8

Note inst. in remarks column

Test sheet : VOL 4,1 C Edition replaces : 02.04.87

Calibrating oil : ISO 4113

Injection pump : VE 6/11F1900 L218 Type number : 0 460 416 047 Type number : 0 460 416 047

Customer-specific information Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 147

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Start of delivery

Prestroke mm : 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value bar: 6,6...7,2

 	Supply-pump pressure characteristic:
full-load del. with charge press.:	
4 4 4 4 4 4 4 5 0 0	1st speed
Speed 1/min: 1500	Charge press. hPa: 1000
Charge press. hPa: 1000	Supp Ty-pump
Del.quantity cm3/	pressure bar: 5,56,1 2nd speed 1/min: 1900
1000Н.: 102,0103,0	2nd speed 1/min: 1900
Dispersion cm3/: 3,5	Charge press. hPa: 1000
1000H : -	Supp Ly-pump
Fully-load dol. Wout change appear	pressure bar: 7,48,0
Full-load del. w/out charge press.:	Overflow, we see suppflow value.
Connect 1/min + 650	Overflow quantity at overflow valve:
Speed 1/min: 650 Del.quantity cm3/	1st speed 1/min: 650
1000H.: 65,566,5	1st speed
	Oveflow: 4183
Low-idle speed regulation:	quantity cm3/10s: (2698)
lan rate speca regulation.	2nd speed 1/min: 1900
Speed 1/min: 350	Charge press. hPa: 1000
Charge press. hPa: -	Overflow : 55138
Del.quantity cm3/ 1000H.: 18,022,0	l quantity cm3/10s: (40153)
1000H.: 18,022,0	
vispersion cm3/: 3,5	<pre>Delivery-quant. and breakaway char.:</pre>
1900H.: -	l 1st speed 1/min: 800
Full-load speed regulation:	Charge-air pressure-setting
	point hPa: 200
Speed 1/min: 2000	Del.quantity cm3/: 86,587,5 1000H.: (84,389,7)
Charge press. hPa: 1000	1000H.: (84,389,7)
Deliquantity cm3/	2nd speed 1/min: 2200
1000H: 67,073,0	Charge press. hPa: 1000
Ohanka.	Del.quantity cm3/: -
Start:	1000H.: 02,5 3rd speed
Speed 1/min: 100	Charge press has 1000
Del.quantity mind.	Charge press. hPa: 1000 Del.quantity cm3/: 5,015,0
cm3/1000H.: 80.0	1000H.: (4,016,0)
	4th speed 1/min: 2000
Inspection-pump test specifications	Charge press. hPa: 1000
Test specifications in parentheses	Del.quantity cm3/: -
	1000H.: (65,574,5)
·	5th speed 1/min: 1900
Timing-device characteristic:	Charge press. hPa: 1000
	Del.quantity cm3/: 91,094,0
1st speed	1000H.: (88,097,0)
Charge press. hPa: 1000	6th speed 1/min: 1500
TD travel mm: 1,02,0	Charge press. hPa: 1000
mm: (0,82,2)	Del.quantity cm3/: -
2nd speed 1/min: 1500 Charge press. hPa: 1000	1000H.: (99,8105,2) 7th speed 1/min: 800
Charge press. hPa: 1000 ID travel	7th speed
mm: (3,14,5)	Del.quantity cm3/: 91,094,0
3rd speed 1/min: 1700	1000H.: (89,895,2)
Charge press. hPa: 1000	8th speed 1/min: 800
TD travel mm: 4,55,3	Charge press. hPa: -
mm: (4,25,6)	Del.quantity cm3/: 68_871_2
4th speed 1/min: 1900	1000H: (66,773,4)
Charge press. hPa: 1000	9th speed 1/min: 650
TD travel mm: 4,55,3	Charge press. hPa: -
mm: $(4,25,6)$	Del.quantity cm3/: -
	1000H: (62,669,4)

```
Zero adelivery (stop):
Mech. shutoff:
               1/min: -
Speed
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 1900
Speed
                volt: 12,0
ELAB
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: -
1000H.: (15,5..24,5)
2nd speed 1/min: 400
Del.quantity cm3/: 5,0...11,0
1000H.: (3,5..12,5)
3rd speed 1/min: 480
Del.quantity cm3/:
Del.quantity cm3/: -
1000H.: 0...2,5
Automatic starting fuel delivery:
1st speed
               1/min: 300
Deliquantity cm3/: -
               1000H: 80,0
 ind.
2nd speed
               1/min: 500
Deliquantity cm3/: -
               1000H: 75,0
Shutoff electromagnet:
Cut-in
                     : 10,0
 min. voltage
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
Designation
                fiill
KF
                     : K-0T
                mm
                    : 0,7..0,95
MS
                mm
SVS max.
                    : 4,0
                 mm
                mm: 18,8...20,8
XK
XL
                mm : 13,7...17,1
Remarks:
```

Note inst. in remarks column

Test sheet : VOL 4,1 D Edition : 02.04.87

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/11F1900 L218-1 Type number : 0 460 416 048

Type number

Customer-specific information : VOLVO PENTA Customer

Engine : TAMD 41

Power k: 147

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening | pressure bar 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm: 450

Start of delivery

Prestroke mm : 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 3,6...4,0

Supply-pump pressure:

1/min: 1500 Speed Charge press. hPa: 1000 Setting value bar: 6,6...7,2

1	Supply-pump pressure characteristic:
Full-load del. with charge press.:	4 1 4000
44: 4500	1st speed
Speed 1/min: 1500	Charge press. hPa: 1000
Charge press. hPa: 1000	Supply-pump
Del.quantity cm3/ 1000H.: 102,0103,0	pressure bar: 5.56,1 2nd speed 1/min: 1900
Dispersion cm3/: 3,5	Charge press. hPa: 1000
1000H : -	Supply-pump
1	pressure bar: 7,48,0
Full-load del. w/out charge press.:	
	Overflow quantity at overflow valve:
Speed 1/min: 650	4nt 4 4/-in- (50
Del.quantity cm3/	1st speed 1/min: 650
1000H.: 65,566,5	Charge press. hPa: - Oveflow : 4183
Low-idle speed regulation:	quantity cm3/10s: (2698)
Low rate speed regulations	2nd speed 1/min: 1900
Speed 1/min: 350	Charge press. hPa: 1000
Charge press. hPa: -	Overflow : 55138
Deliquantity cm3/	quantity cm3/10s: (40153)
1000H.: 18,022,0	Balinana avanta and basabayay aban a
Dispersion cm3/: 3,5	Delivery-quant, and breakaway char.:
1000H.: -	1st speed 1/min: 800 Charge-air pressure-setting
ratt toda speed regarderon.	point hPa: 200
Speed 1/min: 2000	Del.guantity cm3/: 86,587,5
Charge press. hPa: 1000	Del.quantity cm3/: 86,587,5 1000H.: (84,389,7)
Deliquantity cm3/	2nd speed 1/min: 2200
1000H: 67,073,0	Charge press. hPa: 1000
Ohanh.	Del.quantity cm3/: - 1000H.: 02,5
Start:	3rd speed 1/min: 2100
Speed 1/min: 100	Charge press. hPa: 1000
Del.quantity mind.	Del.quantity cm3/: 5,015,0
cm3/1000H.: 80,0	1000H.: (4,016,0)
	4th speed 1/min: 2000
Inspection-pump test specifications	Charge press. hPa: 1000
Test specifications in parentheses	Del.quantity cm3/: - 1000H.: (65,574,5)
	5th speed 1/min: 1900
Timing-device characteristic:	Charge press. hPa: 1000
	Del.quantity cm3/: 91,094,0
1st speed 1/min: 1000	1000H.: (88,097,0)
Charge press. hPa: 1000	6th speed 1/min: 1500
TD travel mm: 1,02,0	Charge press. hPa: 1000
mm: (0,82,2)	Del.quantity cm3/: - 1000H.: (99,8105,2)
2nd speed 1/min: 1500 Charge press. hPa: 1000	7th speed 1/min: 800
Charge press. hPa: 1000	Charge press. hPa: 1000
mm: (3,14,5)	Del.quantity cm3/: 91,094,0
3rd speed 1/min: 1700	1000H.: (89,895,2)
Charge press. hPa: 1000	8th speed 1/min: 800
TD travel mm: 4,55,3	Charge press. hPa: -
mm: (4,25,6)	Del.quantity cm3/: 68,871,2 1000H: (66,673,4)
4th speed 1/min: 1900 Charge press. hPa: 1000	9th speed 1/min: 650
Charge press. hPa: 1000	Charge press. hPa: -
mm: (4,25,5)	Del.quantity cm3/: -
	1000H: (62,669,4)

```
Zero delivery (stop): 1000H.
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: -
1000H.: (15,5..24,5)
2nd speed 1/min: 400
Del.quantity cm3/: 5.0...11.0
1000H.: (3.5...12.5)
               1/min: 480
3rd speed
Del.quantity
               cm3/: -
             1000H.: 0...2,5
Automatic starting fuel delivery:
1st speed
               1/min: 300
Del.quantity cm3/: -
               1000H: 80,0
 ind.
2nd speed
               1/min: 500
Del.quantity cm3/: -
               1000H: 75,0
Shutoff electromagnet:
Cut-in
                    : 20,0
min. voltage
                    : 24,0
Rated voltage
Mounting and assembly dimensions:
Designation
                mm
KF
                    : K-0T
                mm
MS
                    : 0,7..0,95
                mm
                    : 4,0
: 18,8...20,8
SVS max.
                mm
XK
                mm
XL
                    : 13,7...17,1
                mm
Remarks:
Pushing electromagnet.
Correction at adjusting nut (46)
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Full-load del. with charge press.: Note inst. in remarks column 1/min: 1500 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 87,0..,88,0 Test sheet : VOL 4,1 E Edition : 8.12.86 replaces cm3/:-Dispersion 1000H : 5.0 Calibratino oil : ISO 4113 Full-load del. w/out charge press.: Injection pump : VE 6/11F1625 L218-4 : 0 460 416 054 Type number 1/min : 650 Speed Del.quantity cm3/ 1000H.: 59,0...60,0 Customer-specific information Customer : VOLVO PENTA Low-idle speed regulation: : TAMD 41 Engine Power k: 125 Speed 1/min: 350 Charge press. hPa: -Del.quantity cm3/ 1000H.: 15.5...19,5 hisnersion cm3/: 3,5 TEST BENCH REQUIREMENTS Calibrating-oil return temp. °C 1000H.: -Full-load speed regulation: with thermometer : 40...48 electronically : 42...50 Speed 1/min: 1800 Charge press. hPa: 1000 Inlet press., bar: 0.2 Deliquantity cm3/ 1000H: 37,0...43,0 Calibrating nozzle-holder : 1 688 901 022 assembly Start: Opening pressure bar : 130...133 Speed 1/min: 100 Deliquantity mind. cm3/1000H.: 85.0 Test inj. tubing : 1 680 750 073 Inspection-pump test specifications Outside diameter : 6 Test specifications in parentheses x Wall thickness : 2 mm: 450 x Length Timing-device characteristic: Start of delivery Prestroke mm: 0,3 1/min: 800 1st speed Charge press. hPa: 1000 TD travel mm: 1.0...1.8 mm: (0.7...2.1) (from BDC): +-0.02(0.04)Injection-pump setting values Test specifications in parentheses 1/min: 1200 2nd speed Charge press. hPa: 1000 TD travel Timing-device travel: mm: (3,4...4,8)1/min: 1200 1/min: 1400 3rd speed Charge press. hPa: 1000 Setting value mm: 3,9...4,3 Charge press. hPa: 1000 mm: 4,5...5,3 mm: (4,2...5,6) TD travel Supply-pump pressure: Supply-pump pressure characteristic: Speed 1/min: 1200 Charge press. hPa: 1000 Setting value bar: 6,1...6,7 1st speed 1/min: 500 Charge press. hPa: 1000 **B**16

```
Supply-pump
                                                                       1/min: -
               bar: 4,7...5,3
1/min: 1625
                                                        Del.quantity cm3/: - 1000H.
 pressure
2nd speed
                 hPa: 1000
Charge press.
Supply-pump
                                                        Electr. shutoff:
                 bar: 7,3...7,9
                                                        Speed
                                                                       1/min: 1625
 pressure
                                                        ELAB
                                                                        volt: 12,0
                                                        Del.quantity cm3/: - 1000H.
Overflow quantity at overflow valve:
               1/min: 700
1st speed
Charge press. hPa: 1000
                                                        Idle delivery:
Oveflow .
                     : 41...83
 quantity cm3/10s: (26...98)
                                                                       1/min: 350
                                                        1st speed
                                                        Del.quantity cm3/: -
1000H.: (13,0..22,0)
2nd speed 1/min: 1625
Charge press. hPa: 1000
Overflow
                     : 55...138
                                                                       1/min: 400
                                                        2nd speed
 quantity cm3/10s: (40...153)
                                                        Del.quantity cm3/: 3,0...9,0
1000H.: (1,5...10,5)
                                                                       1/min: 450
Delivery-quant. and breakaway char.:
                                                        3rd speed
                                                        Del.quantity cm5/: -
1000H.: 0...3,0
1' : speed
              1/min: 800
Charge-air pressure-setting
 point
                 hPa: 260
Del.quantity cm3/: 66,0...67,0
                                                        Automatic starting fuel delivery:
              1000H.: (63,8...69,2)
               1/min: 1970
                                                                       1/min: 300
2nd speed
                                                        1st speed
Charge press. hPa: 1000
                                                        Del.quantity cm3/: -
Del.quantity cm3/: -
1000H.: 0...3,0
                                                                       1000H: 85,0
                                                         ind.
                                                                       1/min: 500
3rd speed
               1/min: 1900
                                                        2nd speed
Charge press. hPa: 1000
                                                        Del.quantity cm3/: -
Del.quantity cm3/: 2,5...10,5
1000H.: (2,0...11,0)
                                                                       1000H: 80,0
               1/min: 1800
                                                        Shutoff electromagnet:
4th Speed
Charge press. hPa: 1000
Del. quantity cm3/: -
1000H.: (35,5...44,5)
Sth speed 1/min: 1625
                                                        Cut-in
                                                         min. voltage
                                                                            : 10,0
                                                        Rated voltage
                                                                            : 12,0
Charge press. hPa: 1000
Del.quantity cm3/: 80,0...83,0
1000H.: (78,8...84,2)
                                                        Mounting and assembly dimensions:
               1/min: 1500
6th speed
                                                        Designation
Charge press. hPa: 1000
                                                                        mm
Del.quantity cm3/: -
1000H.: (84,8...90,2)
                                                        KF
                                                                            : K-0T
                                                                        mm
                                                        MS
                                                                        mm
                                                                            : 1,2..1,45
               1/min: 1000
                                                        SVS max.
                                                                       mm
7th speed
                                                        XK
                                                                            : 18,8...20,8
Charge press. hPa: 1000
                                                                        mm
Del.quantity cm3/: 93,8...96,2
1000H.: (92,3...97,7)
                                                        XL
                                                                           : 12,2...15,6
                                                                       mm
8th speed
               1/min: 800
                                                        Remarks:
Charge press. hPa: 1000
Del.quantity cm3/: 91,5...94,5
1000H: (89,6...96,4)
                                                        Pushing electromagnet.
               1/min: 650
9th speed
Charge press. hPa: -
                                                        Correction at adjusting nut (46)
Del.quantity cm3/: -
               1000H: (56,8...62,2)
Zero delivery (stop):
```

Mech. shutoff:

```
BOSCH-INJ.-PUMP TEST SPECIFICATIONS
                                                     Full-load del. with charge press.:
                                                     Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 87,0...88,0
Note inst. in remarks column
                  : VOL4,1 F
Test sheet
Edition
                   : 8.12.86
                                                                   cm3/:5,0
replaces
                                                     Dispersion
Calibrating oil
                   : ISO 4113
                                                                  1000H: -
Injection pump
                   : VE 6/11F1625 L218-5
                                                     Full-load del. W/out charge press.:
                   : 0 460 416 055
Type number
                                                     Speed
                                                                  1/min : 650
                                                     Del.quantity cm3/
Customer-specific information
                                                                  1000H.: 59,0...60,0
                   : VOLVO PENTA
Customer
                                                     Low-idle speed regulation:
                  : TAMD 41
Engine
                                                                   1/min: 350
Power
                  k: 125
                                                     Speed
                                                     Charge press. hPa: -
                                                     Deliquantity cm3/
TEST BENCH REQUIREMENTS
                                                                 1000H.: 15,5...19,5 cm3/: 3,5
Calibrating-oil oc
                                                     Dispersion
                                                                  1000H .: -
 return temp.
with thermometer : 40...48
                                                     Full-load speed regulation:
electronically
                  : 42...50
                                                     Speed
                                                                   1/min: 1800
                                                     Charge press. hPa: 1000
Inlet press., bar: 0.2
                                                     Del.quantity cm3/
1000H: 37,0...43,0
Calibrating nozzle-holder
                   : 1 688 901 022
 assembly
                                                     Start:
Opening
 pressure bar : 130...133
                                                                  1/min: 100
                                                     Speed
                                                     Del.quantity mind.
                                                             cm3/1000H.: 85.0
Test inj. tubing : 1 680 750 073
                                                     Inspection-pump test specifications
                                                     Test specifications in parentheses
Outside diameter : 6
x Wall thickness : 2
x Length
                mm: 450
                                                     Timing-device characteristic:
Start of delivery
Prestroke
               mm : 0,3
                                                     1st speed
                                                                  1/min: 800
         (from BDC): +-0,02(0,04)
                                                     Charge press. hPa: 1000
                                                     TD travel
                                                                      mm: 1,0...1,8
                                                    mm: (0,7...2,1)
2nd speed 1/min: 1200
Charge press. hPa: 1000
Injection-pump setting values
Test specifications in parentheses
                                                     TD travel
                                                                      mm: ·
Timing-device travel:
                                                                      mm: (3,4...4,8)
                                                                  1/min: 1400
             1/min: 1200
                                                     3rd speed
Speed
Charge press. hPa: 1000
Setting value mm: 3,9...4,3
                                                     Charge press. hPa: 1000
                                                                      mm: 4,5...5,3
mm: (4,2...5,6)
                                                     TD travel
Supply-pump pressure:
                                                     Supply-pump pressure characteristic:
             1/min: 1200
Speed
                                                                  1/min: 500
Charge press. hPa: 1000
                                                     1st speed
Setting value bar: 6,1...6,7
                                                     Charge press. hPa: 1000
B18
```

```
1/min: -
Supply-pump
                                                          Speed
                  bar: 4,7...5,3
                                                          Del.quantity cm3/: - 1000H.
 pressure
                1/min: 1625
2nd speed
                  hPa: 1000
Charge press.
Supply-pump
                                                          Electr. shutoff:
                  bar: 7,3...7,9
 pressure
                                                          Speed
                                                                          1/min: 1625
                                                          Deliquantity cm3/: - 1000H.
Overflow quantity at overflow valve:
               1/min: 700
1st speed
                                                          Idle delivery:
Charge press. hPa: 1000
Oveflow
                      : 41...83
                                                                          1/min: 350
                                                          1st speed
 quantity cm3/10s: (26...98)
                                                          Del.quantity cm3/: -
2nd speed 1/min: 1625
                                                                         1000H.: (13,0..22,0)
Charge press. hPa: 1000
                                                                          1/min: 400
                                                          2nd speed
                                                          Del.quantity cm3/: 5,0...50
1000H.: (1,5...10,5)
                     : 55...138
Overflow
 quantity cm3/10s: (40...153)
                                                                          1/min: 450
                                                          3rd speed
                                                          Del.quantity cm3/: -
1000H.: 0...3,0
Delivery-quant. and breakaway char.:
1st speed
              1/min: 800
Charge-air pressure-setting
                  hPa: 260
 point
                                                          Automatic starting fuel delivery:
Del.quantity cm3/: 66,0...67,0
              1000H.: (63,8...69,2)
                                                                          1/min: 300
                                                          1st speed
                1/min: 1970
2nd speed
                                                          Del.quantity
                                                                          cm3/: -
                                                                          1000H: 85.0
Charge press. hPa: 1000
                                                           ind.
Del.quantity cm3/: -
1000H.: 0...3,0
                                                                          1/min: 500
                                                          2nd speed
3rd speed 1/min: 1900
Charge press. hPa: 1000
Del.quantity cm3/: 2,5...10,5
1000H.: (2,0...11,0)
                                                          Del.quantity cm3/: -
                                                                          1000H: 80,0
                                                           ax.
                                                          Shutoff electromagnet:
               1/min: 1800
4th speed
Charge press. hPa: 1000
                                                          Cut-in
Deliquantity cm3/: -
                                                           min. voltage
                                                                                : 20,0
1000H: (35,5...44,5)
5th speed 1/min: 1625
Charge press. hPa: 1000
Del.quantity cm3/: 80,0...83,0
1000H: (78,8...84,2)
                                                          Rated voltage
                                                                                : 24,0
                                                          Mounting and assembly dimensions:
                                                          Designation
               1/min: 1500
6th speed
                                                          K
                                                                           mm
                                                          KF
Charge press. hPa: 1000
                                                                                : K-0T
                                                                           шш
Del.quantity cm3/: -
1000H.: (84,8...90,2)
                                                                               : 1,2..1,45
                                                          MS
                                                                           mm
                                                                               : 3,6
: 18,8...20,8
                                                          SVS max.
                                                                           mm
               1/min: 1000
                                                          XK
                                                                           mm
7th speed
Charge press. hPa: 1000
Del.quantity cm3/: 93,8...96,2
1000H.: (92,3...97,7)
8th speed 1/min: 800
                                                          XL
                                                                                : 12,2...15,6
                                                                           mm
                                                          Remarks:
                                                          Pushing electromagnet.
Charge press. hPa: 1000
Del.quantity cm3/: 91,5...94,5
1000H: (89,6...96,4)
               1/min: 650
9th speed
Charge press. hPa: -
                                                          Correction at adjusting nut (46)
Del.quantity
               cm3/: -
               1000H: (56,8...62,2)
Zero delivery (stop):
Mech. shutoff:
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 A5 Test sheet : 22.10.86 Edition : 4.85 replaces Calibrating oil : ISO-4113 Injection pump : VE 4/12F1100 R123-5 Type number : 0 460 424 011 Customer-specific information : CUMMINS Customer : 4 BT-390 Engine Power k: 60 1/mi: 2200 Speed TEST BENCH REQUIREMENTS Calibrating-oil C return temp. With thermometer : 40...48 electronically : 42...50 Inlet press., bar : 0.2 Calibrating nozzle-holder : 1 688 901 016 assembly Opening bar : 207...210 pressure Perforated-plate mm : 0.5 diameter Test inj. tubing : 1 680 750 017 Outside diameter x Wall thickness : 2 mm: 840 x Length Start of delivery mm : 0,3 Prestroke (from BDC): +-0.02(0.04)Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 900 Speed

1/min: 900 Setting value bar: 4,3...4,9 Full-load del. w/out charge press.: 1/min: 900 Speed Del.quantity cm3/ 1000H.: 70,5...71,5 cm3/: 4,0 Dispersion 1000H.: (4,5) Low-idle speed regulation: 1/min: 375 Del.quantity cm3/ 1000H.: 8,0...14,0 Full-load speed regulation: 1/min: 1120 Speed Del.quantity cm3/ 1000H: 52,0...58,0 Start: 1/min: 100 Speed Del.quantity mind. cm3/1000H.: 97,0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 600 1st speed mm: 0,4...1,2 TD travel mm: (0,1...1,5)1/min: 900 2nd speed TD travel mm: mm: (1,8...3,2) 1/min: 1100 3rd speed TD travel mm: 3,3...4,1 mm: (3,0...4,4) Supply-pump pressure characteristic: 1/min: 400 1st speed Supply-pump bar: 2,1...2,7 1/min: 750 pressure 2nd speed Supply-pump bar: 3,7...4,3 pressure 1/min: 1100 3rd speed Supply-pump bar: 5,2...5,8 pressure Overflow quantity at overflow valve:

1/min: 400

1st speed

Setting value mm: 2,3...2,7

```
Oveflow
                      : 41...83
             cm3/10s: (26...98)
1/min: 1100
 quantity
2nd speed
Over flow
                     : 55...138
 quantity cm3/10s: (40...153)
Delivery-quant. and breakaway char.:
1st speed
               1/min: 1230
Del.quantity cm3/: -
1000H.: 0...2,0
3rd speed
               1/min: 1200
Del.quantity cm3/: -
1000H.: 0...15,0
4th speed
               1/min: 1160
Del.quantity cm3/: -
1000H.: 0...15,0
5th speed
                1/min: 1120
Del.quantity cm3/: -
1000H.: (50,0...60,0)
6th speed 1/min: 1100
Del.quantity cm3/: 64,5...67,5
1000H.: (63,0...69,0)
7th speed
                1/min: 900
Del.quantity cm3/: -
1000H.: (68,0...74,0)
                1/min: 750
8th speed
                cm3/: 70,5...74,5
Del.quantity
                1000H: (68,8...76,2)
                1/min: 400
9th speed
Del.quantity cm3/: 63,5...67,5
1000H: (61,8...69,2)
Zero delivery (stop):
Mech. shutoff:
Speed
               1/min: 1100
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 1100
Speed
ELAB
                volt: -
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: 17.0..23.0
1000H.: (15.0..25.0)
               1/min: 375
2nd speed
Del.quantity cms/:-
1000H.: (6,0...16,0)
               1/min: 450
3rd speed
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delivery:
1st speed
               1/min: 130
```

Del.quantity cm3/: -1000H: 97,0 ind. 1/min: 200 2nd speed Del.quantity cm3/: -1000H: 85,0 Shutoff electromagnet: Cut-in : 10,0 min. voltage : 12,0 Rated voltage Mounting and assembly dimensions: Designation tinto KF : 5,1...5,4 mm : 1,4...1,6 : 3,4 : 20,2...22,2 MS mm SVS max. mm XK mm : 12,5...15,9 XL mm

Note inst. in remarks column

: CUM 3,9 A6 Test sheet : 1.10.86 Edition replaces : 1.85 Calibrating oil : ISO-4113

Injection pump : VE 4/12F1050 R123-6 Type number : 0 460 424 012

Type number

Customer-specific information Customer : CUMMINS

Engine : 4 BT-390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening bar : 207...210 pressure

Perforated-plate

mm : 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke

e mm: 0,3 (from BDC): +-0,02,(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900 Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900 Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:	2nd speed 1/min: 1050 Overflow : 55138
Speed 1/min: 900 Del.quantity cm3/	quantity cm3/10s: (40153
1000H.: 64,565,5 Dispersion cm3/: 4,0 I 1000H.: (4,5)	Delivery-quant. and breakaway char.: 1st speed 1/min: 1160 Del.quantity cm3/: - 1000H.: 01,5
Low-idle speed regulation:	2nd speed 1/min: 1110 Del.quantity cm3/: -
Speed 1/min: 420 Del.quantity cm3/	1000H.: (30,040,0) 3rd speed 1/min: 1050
1000H.: 18.524,5 Dispersion cm3/: 3.5 1000H.: (4.5)	Del.quantity cm3/: 59,562,5 1000H.: (58,064,0) 4th speed 1/min: 900
Full-load speed regulation:	Del.quantity cm3/: - 1000H.: (62,068,0)
Speed 1/min: 1110 Del.quantity cm3/ 1000H: 32,038,0	5th speed 1/min: 750 Del.quantity cm3/: 64,068,0 1000H.: (63,368,7) 6th speed 1/min: 500
Start:	Del.quantity cm3/: 60,064,0 1000H.: (59,364,7)
Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 97,0	Zero delivery (stop):
Inspection-pump test specifications Test specifications in parentheses	Mech. shutoff: Speed 1/min: - Del.quantity cm3/: - 1000H.
Timing-device characteristic:	Electr. shutoff: Speed 1/min: 375
1st speed 1/min: 750 TD travel mm: 1.11.9 mm: (0,82,2)	Del.quantity cm3/: - 1000H.
2nd speed	Idle delivery:
mm: (1,83,2) 3rd speed	1st speed
Supply-pump pressure characteristic:	Del.quantity cm3/: - 1000H.: 01,5
1st speed 1/min: 500 Supply-pump	Automatic starting fuel delivery:
pressure bar: 2,83,4 2nd speed 1/min: 750 1 Supply-pump	1st speed 1/min: 130 Del.quantity cm3/: - ind. 1000H: 97,0
pressure bar: 3,84,4 3rd speed 1/min: 1050 Supply-pump	2nd speed 1/min: 200 Del.quantity cm3/: -
pressure bar: 4,95,5	ax. 1000H: 85,0
Overflow quantity at overflow valve:	Shutoff electromagnet:
1st speed	Cut-in min. voltage : 10,0 Rated voltage : 12,0
B23	

Mounting and assembly dimensions:

Designation K KF MS SVS max. XK XL mm : -mm : 5,2-5,5 mm : 1,4-1,65 mm : 4,2 mm : 20,2-22,2 mm : 11,7-15,0

Note inst. in remarks column

Test sheet : CUM 3.9 E Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : V£ 4/12F1100 R226 Type number : 0 460 424 022

Customer-specific information : CUMMINS

: 4BT-3.9 Engine

k: 70 Power Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer: 40...48 electronically: 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,3...2,7

```
1/min: 500
Speed
              1/min: 900
                                                        1st speed
                                                        Oveflow.
                                                                            : 41...83
Setting value bar: 4,1...4,7
                                                                    cm3/10s: (26...98)
1/min: 1100
                                                         quantity
Full-load del. W/out charge press.:
                                                        2nd speed
                                                        Over flow
                                                                            : 55...138
                                                         quantity cm3/10s: (40...153)
Speed
             1/min: 900
Deliquantity cm3/
             1000H.: 65,5...66,5
                                                        Delivery-quant, and breakaway char.:
                cm3/: 4,0
                                                        1st speed
                                                                       1/min: 1250
Dispersion
                                                        Del.quantity cm3/: -
1000H.: 0...2,0
             1000H.: (4,5)
Low-idle speed regulation:
                                                        3rd speed
                                                                       1/min: 1220
                                                        Del.quantity cm3/: -
1000H.: 0...15,0
Speed
               1/min: 375
                                                                       1/min: 1180
Del.quantity cm3/
                                                        4th speed
             1000H.: 8,0...14,0
                                                        Del.quantity cm3/: -
                                                                      1000H.: 0...15,0
                cm3/: 5,5
Dispersion
             1000H.: -
                                                                       1/min: 1150
                                                        5th speed
                                                        Del.quantity cm3/: -
1000H.: (51,0...61,0)
6th speed 1/min: 1100
Full-load speed regulation:
Speed
               1/min: 1150
                                                        Del.quantity cm3/: 03,3...68,0)
Deliquantity cm3/
               1000H: 53,0...59,0
                                                                       1/min: 900
                                                        7th speed
Start:
                                                                        cm3/: -
                                                        Del.quantity
                                                                      1000H.: (63,0...69,0)
                                                                       1/min: 750
               1/min: 100
Speed
                                                        8th speed
                                                        Del.quantity cm3/: 68.0...72.0
1000H: (66.3...73.7)
9th speed 1/min: 500
Del.quantity mind.
         cm3/1000H.: 70,0
                                                                      cm3/: 67,0...75,0
Inspection-pump test specifications
                                                        Del.quantity
                                                                       1000H: (67,3...74,7)
Test specifications in parentheses
                                                        Zero delivery (stop):
Timing-device characteristic:
                                                        Mech. shutoff:
               1/min: 750
                                                                       1/min: -
1st speed
                                                        Speed
                                                        Deliquantity cm3/
1000H.
                  mm: 1,3...2,1
mm: (1,0...2,4)
                                                                       cm3/: -
TD travel
2nd speed
               1/min: 900
                                                        Electr. shutoff:
TD travel
                  man: -
                  mm: (1,8...3,2)
                                                                       1/min: 375
                                                        Speed
               1/min: 1100
                                                        Del.quantity cm3/: - 1000H.
3rd speed
                  mm: 3,1...3,9
TD travel
                  mm: (2,8...4,2)
                                                        Idle delivery:
Supply-pump pressure characteristic:
                                                        1st speed
                                                                       1/min: 300
                                                        Del.quantity cm3/: 35,0..47,0
1090H.: (36,0..46,0)
2nd speed 1/min: 375
ist speed
               1/min: 200
Supply-pump
                 bar: 0,8...1,4
pressure
                                                        Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
               1/min: 500
2nd speed
Supply-pump
              bar: 2,3...2,9
1/min: 1100
pressure
                                                        Del.quantity cm3/: -
1000H.: 0...4.0
3rd speed
Supply-pump
                bar: 4,9...5,5
pressure
                                                        Automatic starting fuel delivery:
Overflow quantity at overflow valve:
                                                                       1/min: 130
                                                        1st speed
```

Del.quantity cm3/: -ind. 1000H: 80,0

2nd speed 1/min: 240
Del.quantity cm3/: ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in

min. voltage Rated voltage : 10,0

Mounting and assembly dimensions:

Designation

K KF mm mm : 5,1...5,4 mm : 1,2..1,45 min : 4,2 mm : 20,2...22,2 mm : 11,0...14,4 MS SVS max.

ΧK XL

Note inst. in remarks column

Test sheet : CUM 3.9 E1 Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R226-1 Type number : 0 460 424 023

Customer-specific information Customer : CUMMINS

: 4BT-3.9 Engine

k: 53 1/mi: 2300 Power Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,0...2,4

```
Speed
                                                                       1/min: 500
              1/min: 900
                                                        1st speed
Setting value bar: 4,2...4,8
                                                        Oveflow.
                                                                            : 41...83
                                                         quantity cm3/10s: (26...98) nd speed 1/min: 1150
Full-load det. w/out charge press.:
                                                        2nd speed
                                                        Over flow
                                                                            : 55...138
                                                         quantity cm3/10s: (40...153)
Speed
              1/min: 900
Del.quantity cm3/
              1000H.: 67,0...68,0
                                                        Delivery-quant. and breakaway char.:
               cm3/: 4.0
                                                                      1/min: 1300
                                                        1st speed
Dispersion
                                                        Del.quantity cm3/: -
1000H.: 0...2,0
              1000H.: (4,5)
                                                                       1/min: 1240
Low-idle speed regulation:
                                                        3rd speed
                                                        Del.quantity cm3/: 13.0...25.0
1000H.: (14.0...24.0)
               1/min: 375
Del.quantity
                                                                       1/min: 1190
               cm3/
                                                        4th speed
                                                        Del.quantity cm3/: -
1000H.: (45,0...55,0)
              1000H.: 8,0...14,0
Dispersion
                cm3/: 5,5
                                                                      1/min: 1150
              1000H .: -
                                                        5th speed
                                                        Del.quantity cm3/: 63.5...66.5
1000H.: (62.0...68.0)
Full-load speed regulation:
Speed
              1/min: 1190
                                                        6th speed
                                                                       1/min: 900
                                                        Del.quantity cm3/: -
1000H.: (64,5...70,5)
Deliquantity cm3/
              1000H: 47,0...53,0
                                                                       1/min: 750
                                                        7th speed
                                                        Del.quantity cm3/: 69,5...73,5
1000H.: (67,8...75,2)
Start:
                                                                       1/min: 500
Speed
              1/min: 100
                                                        8th speed
                                                        Del.quantity cm3/: 68.0...76.0
1000H: (68.3...75.7)
Del.quantity mind.
         cm3/1000H.: 70,0
Inspection-pump test specifications.
                                                        Zero delivery (stop):
Test specifications in parentheses
                                                        Mech. shutoff:
                                                        Speed
                                                                       1/min: -
                                                        Del.quantity cm3/: - 1000H.
Timing-device characteristic:
1st speed
               1/min: 750
TD travel
                  mm: 0,8...1,6
                                                        Electr. shutoff:
                  mm: (0,5...1,9)
                                                        Speed
                                                                      1/min: 375
                                                        Del.quantity cm3/: - 1000H.
2nd speed
               1/min: 900
TD travel
                  mm: -
              mm: (1,5...2,9)
1/min: 1150
3rd speed
                                                        Idle delivery:
                  mm: 3,2...4,0
TD travel
                                                        1st speed 1/min: 300
Del.quantity cm3/: 32,0..44,0
1000H.: (33,0..43,0)
2nd speed 1/min: 375
                  mm: (2,9...4,3)
Supply-pump pressure characteristic:
                                                        Del.quantity cm3/: -
1000H.: (6,0...16,0)
1st speed
              1/min: 200
Supply-pump
                 bar: 0,9...1,5
                                                                       1/min: 500
pressure
                                                        3rd speed
              1/min: 500
                                                        Del.quantity cm3/: -
1000H.: 0...4,0
2nd speed
Supply-pump
              bar: 2,5...3,1
1/min: 1150
pressure
3rd speed
                                                        Automatic starting fuel delivery:
Supply-pump
                 bar: 5,2...5,8
                                                                       1/min: 130
                                                        1st speed
pressure
                                                        Del.quantity cm3/: -
                                                                       1000H: 80,0
Overflow quantity at overflow valve:
                                                         ind.
```

2nd speed 1/min: 240
Del.quantity cm3/: 1000H: 80,0

Shutoff electromægnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation K KF mm mm : 5,1...5,4 mm : 1,2..1,45 mm : 4,2 mm : 18,8...20,8 mm : 11,7...15,1 MS

SVS max.

ΧK XL

Note inst. in remarks column

Test sheet : CUM 3,9 E2 Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R226-2 Type number : 0 460 424 024

Customer-specific information Customer : CUMMINS

Engine : 4BT 3.9

k: 55 Power 1/mi: 2500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 42...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,0...2,4

```
1/min: 500
              1/min: 900
                                                        1st speed
Setting value bar: 4,6...5,2
                                                        Oveflow |
                                                                            : 41...83
                                                                    cm3/10s: (26...98)
                                                         quantity
                                                                      1/min: 1250
Full-load det. w/out charge press.:
                                                        2nd speed
                                                        Over flow
                                                                            : 55...138
                                                         quantity cm3/10s: (40...153)
Speed
             1/min : 1100
Del.quantity cm3/
             1000H.: 65,5...66,5
                                                        Delivery-quant. and breakaway char.:
                cm3/: 4,0
Dispersion
                                                        1st speed
                                                                      1/min: 1400
                                                       Del.quantity cm3/: -
1000H.: 0...2,0
              1000H.: (4,5)
                                                                      1/min: 1370
Low-idle speed regulation:
                                                        3rd speed
                                                       Del.quantity cm3/: -
1000H.: 0...15,0
Speed
               1/min: 335
               cm3/
                                                                      1/min: 1330
Del.quantity
                                                        4th speed
                                                       Del.quantity cm3/: -
1000H.: 0...15,0
             1000H.: 8,0...14,0
                cm3/: 5,5
Dispersion
             1000H.: -
                                                                      1/min: 1290
                                                        5th speed
                                                       Del.quantity cm3/: -
1000H.: (40,0...50,0)
Full-load speed regulation:
                                                                      1/min: 1250
              1/min: 1290
Speed
                                                        6th speed
                                                       Del.quantity cm3/: 63.0...66.0
1000H.: (61.5...67.5)
7th speed 1/min: 1100
Del.quantity
               cm3/
               1000H: 42,0...48,0
                                                       Del.quantity cm3/: -
1000H.: (63,0...69,0)
Start:
                                                                      1/min: 750
Speed
              1/min: 100
                                                        8th speed
                                                       Del.quantity cm3/: 69,0...73,0
1000H: (67,3...74,7)
Del.quantity mind.
         cm3/1000H.: 70,0
                                                       9th speed 1/min: 500
Del.quantity cm3/: 70,0...78,0
Inspection-pump test specifications
                                                                      1000H: (70,3...73,7)
Test specifications in parentheses
                                                        Zero delivery (stop):
Timing-device characteristic:
                                                       Mech. shutoff:
               1/min: 750
                                                                      1/min: -
1st speed
                                                       Speed
                                                       Del.quantity cm3/
1000H.
                  mm: 0,8...1,6
mm: (0,5...1,9)
TD travel
                                                                      cm3/: -
               1/min: 900
2nd speed
                                                       Electr. shutoff:
TD travel
                  mm: -
              mm: (1,5...2,9)
1/min: 1100
                                                        Speed
                                                                      1/min: 335
                                                       Del.quantity cm3/: - 1000H.
3rd speed
TD travel
                  mm: 2,9...3,7
mm: (2,6...4,0)
                                                        Idle delivery:
Supply-pump pressure characteristic:
                                                                      1/min: 335
                                                       1st speed
                                                       Del.quantity cm3/: -
1000H.: (6,0...16,0)
              1/min: 200
1st speed
Supply-pump
              bar: 1,3...1,9
1/min: 750
                                                                      1/min: 500
                                                       2nd speed
 pressure
                                                       Del.quantity cm3/: -
1000H.: 0...4,0
2nd speed
Supply-pump
                bar: 3,9...4,5
pressure
              1/min: 1100
                                                       Automatic starting fuel delivery:
3rd speed
Supply-pump
                bar: 2,9...3,7
                                                                      1/min: 130
 pressure
                                                       1st speed
                                                       Del.quantity cm3/: -
                                                                      1000H: 75.0
Overflow quantity at overflow valve:
                                                        ind.
```

2nd speed 1/min: 300 Del.quantity cm3/: -ax. 1000H: 75,0 Shutoff electromagnet: Cut-in min. voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions:

Designation

K KF mm mm : 5,1...5,4 mm : 1,2..1,45 mm : 4,2 mm : 18,8...20,8 mm : 11,5...14,9 MS SVS max. ХK XL

Note inst. in remarks column

Test sheet : CUM 3,9 D2 Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R231 Type number : 0 460 424 028

Customer-specific information Customer : CUMMINS

: 4BTA-3.9 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening -

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery
Prestroke mm: 0,3
(from BDC): +-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850 Charge press. hPa: 1000 Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 850 Charge press. hPa: 1000

Setting value bar: 5,6...6,2 Supply-pump bar: 4,0...4,6 1/min: 1100 pressure Full-load del. with charge press.: 2nd speed Charge press. hPa: 1000 Supply-pump 1/min: 850 Speed Charge press. hPa: 1000 pressure bar: 6,7...7,3 Del.quantity cm3/ 1000H.: 85,5...86,5 Overflow quantity at overflow valve: cm3/:4.0Dispersion 1000H : (4,5)1/min: 500 1st speed Charge press. hPa: -Full-load del. w/out charge press.: Oveflow : 41...83 quantity cm3/10s: (26...98) 1/min : 500 2nd speed 1/min: 1250 Deliquantity cm3/ Charge press. hPa: 1000 1000H.: 63,5...64,5 : 55...138 Cverflow quantity cm3/10s: (40...153) Low-idle speed regulation: Delivery-quant. and breakaway char.: 1st speed 1/min: 700 Speed 1/min: 365 Charge press. hPa: -Charge-air pressure-setting Del.quantity cm3/ 1000H.: 8,0...14,0 point hPa: 350
Del.quantity cm3/: 79,5...80,5
1000H.: (77,0...83,0) Full-load speed regulation: 1/min: 1420 2nd speed 1/min: 1310 Charge press. hPa: 1000 Speed Del.quantity cm3/: -1000H.: 0...2,0 Charge press. hPa: 1000 Deliquantity cm3/ 3rd speed 1/min: 1400 Charge press. hPa: 1000 1000H: 61,0...67,0 Del.quantity cm3/: -1000H.: 0...15,0 Start: 1/min: 1360 Speed 1/min: 100 4th speed Del.quantity mind. cm3/1000H.: 60,0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: Charge press. hPa: 1000
Del.quantity cm3/: 75,5...78,5
1000H.: (74,0...80,0)
7th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm3/: 77,5...78,5
1000H.: (76,0...80,5)
8th speed 1/min: 850
Charge press. hPa: 1000 1/min: 500 1st speed Charge press. hPa: 1000 mm: 1,8...2,6 mm: (1,5...2,9) TD travel 1/min: 850 2nd speed Charge press. hPa: 1000 TD travel mm: mm: (3,5...4,9)Charge press. hPa: 1000 1/min: 1100 Del.quantity cm3/: -3rd speed 1000H: (83,0...89,0)
9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm3/: 91,0...99,0 Charge press. hPa: 1000 mm: 4,9...5,7 TD travel mm: (4,6...6,0)1000H: -Supply-pump pressure characteristic: 1/min: 500 10th speed 1/min: 500 Charge press. hPa: -1st speed Charge press. hPa: 1000 Del.quantity cm3/: -1000H: (61,0...67,0)

```
Zero delivery (stop):
Mech. shutoff:
Speed
              1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
              1/min: 365
Speed
Del.quantity cm3/: ~ 1000H.
Idle delivery:
1st speed
              1/min: 365
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed
              1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delivery:
              1/min: 130
1st speed
Del.quantity cm3/: -
              1000H: 60,0
 ind.
2nd speed
              1/min: 230
Del.quantity cm3/: -
              1000H: 60,0
Shutoff electromagnet:
Cut-in
                  : 10,0
 min. voltage
Rated voltage
                   : 12,0
Mounting and assembly dimensions:
Designation
K
               mm
                   5,1...5,4
: 1,1..1,35
: 2,6
KF
               mm
MS
               mm
SVS max.
               mm
                   : 20,2...22,2
XK
               mm
XL
                   : 13,1...16,6
               mm
```

Note inst. in remarks column

Test sheet : CUM 3,9 D3 Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R239-1 Type number : 0 460 424 031

Customer-specific information Customer : CUMMINS

Engine : 4BT-3.9 AUTO

k: 77 Power 1/mi: 2500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 0,8...1,2

Supply-pump pressure characteristic: 1/min: 1100 Speed Charge press. hPa: 1000 1/min: 500 1st speed Charge press. hPa: 1000 Setting value bar: 5,7...6,3 Supply-pump bar: 2,9...3,5 1/min: 850 Full-load del. with charge press.: pressure 2nd speed Charge press. hPa: 1000 Speed 1/min: 850 Charge press. hPa: 1000 Supply-pump Del.quantity cm3/ 1000H.: 82,0...83,0 bar: 4.6.25,2 1/min: 1250 pressure 3rd speed cm3/:4.0Charge press. hPa: 1000 Dispersion 1000H : (4,5) Supply-pump bar: 6,3...6,9 pressure Full-load del, w/out charge press,: Overflow quantity at overflow valve: Speed 1/min : 500 Del.quantity cm3/ 1000H.: 54,0...55,0 1/min: 500 1st speed Charge press. hPa: Oveflow : 41...83 quantity cm3/10s: (26...98) 2nd speed 1/min: 1250 Low-idle speed regulation: Charge press. hPa: 1000 Overflow: 55... Speed 1/min: 375 Charge press. hPa: -: 55...138 Del.quantity cm3/ 1000H.: 13,5...19,5 hishersion cm3/: 5,5 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 700 1000H.: 1st speed Full-load speed regulation: Charge-air pressure-setting point hPa: 600
Del.quantity cm3/: 72.0...73.0
1000H.: (69.5...75.5)
2nd speed 1/min: 1520 1/min: 1400 Speed Charge press. hPa: 1000 Deliquantity cm3/ 2nd speed Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...2,0 1000H: 59,5...65,5 Start: 3rd speed 1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...15,0 Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 60,0 4th speed 1/min: 1460 Charge press. hPa: 1000 Inspection-pump test specifications Del.quantity cm3/: -1000H.: 0...15,0 Test specifications in parentheses 5th speed 1/min: 1400 Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: (57,5...67,5) 6th speed 1/min: 1250 Timing-device characteristic: 1/min: 1050 1st speed Charge press. hPa: 1000 Charge press. hPa: 1000
Del.quantity cm3/: 75,0...78,0
1000H.: (73,5...79,5)
7th speed 1/min: 1100 mm: 0,3...1,1 TD travel mm: (0...1,4)1/min: 1100 2nd speed Charge press. hPa: 1000 Charge press. hPa: 1000
Del.quantity cm3/: 77,0...80,0
1000H.: (75,5...81,5)
8th speed 1/min: 850 TD travel mm: mm: (0,3...1,7) 1/min: 1250 3rd speed Charge press. hPa: 1000 Charge press. hPa: 1000 TD travel mm: 1,5...2,3 Del.quantity cm3/: mm: (1,2...2,6) 1000H: (79,5...85,5)

```
9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm3/: 101.0...109.0
1000H: (101.3...108.7)
               1/min: 500
10th speed
Charge press. hPa: -
Del.quantity cm3/: -
               1000H: (51,5...57,5)
Zero delivery (stop):
Mech. shutoff:
Speed
               1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 375
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
               1/min: 375
1st speed
Del.quantity cm3/: -
              1000H.: (11,5..21,5)
2nd speed
               1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delivery:
               1/min: 340
1st speed
Del.quantity cm3/: -
               1000H: 75,0
 ind.
2nd speed
               1/min: 440
Del.quantity cm3/:
               1000H: 80,0
 ax.
Shutoff electromagnet:
Cut-in
 min. voltage
                     : 10,0
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
Designation
                mm
KF
                     : K-0T
                mm
                     : 1,1..1,35
: 3,8
MS
                mm
SVS max.
                mm
                    : 20,2...22,2
XK
                mm
XL.
                    8, 15, 4, 12 :
                mm
Remarks:
Correction at adjusting nut (46)
```

Note inst. in remarks column

Test sheet : CUM 3,9 D1 Edition replaces : 11.12.86

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R230-3 Type number : 0 460 424 033

Customer-specific information Customer : CUMMINS

Engine : 4BTA-3.9

k: 79 Power 1/mi: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750 Charge press. hPa: 1000 Setting value mm: 3,4...3,8

1st speed 1/min: 500 Charge press. hPa: 1000 Speed 1/min: 750 Charge press. hPa: 1000 Setting value bar: 5,0...5,6 Supply-pump bar: 3,9...4,5 1/min: 1050 pressure 2nd speed hPa: 1000 Full-load del. with charge press.: Charge press. Supply-pump Speed 1/min: 750 bar: 6,3...6,9 pressure Charge press. hPa: 1000 Del.quantity cm3/ Overflow quantity at overflow valve: 1000H.: 89,5...90,5 cm3/: 4,0 Dispersion 1/min: 500 1st speed 1000H : (4,5) Charge press. hPa: -Oveflow' : 41...83 quantity cm3/10s: (26...98) Full-load del. w/out charge press.: 2nd speed 1/min: 1050 Charge press. hPa: 1000 Speed 1/min : 500 Over flow : 55...138 Del.quantity cm3/ quantity cm3/10s: (40...153) 1000H.: 63,5...64,5 Low-idle speed regulation: Delivery-quant. and breakaway char.: 1st speed 1/min: 700 1/min: 375 Charge-air pressure-setting Speed point hPa: 350
Del.quantity cm3/: 79,5...80,5
1000H.: (77,0...83,0) Charge press. hPa: -Del.quantity cm3/ 1000H.: 8,0...14,0 1/min: 1180 full-load speed regulation: 2nd speed Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...2,0 Speed 1/min: 1100 Charge press. hPa: 1000 1/min: 1160 Del.quantity cm3/ 3rd speed Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...15,0 1000H: 59,0...65,0 Start: 1/min: 1120 4th speed Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...15,0 Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 60,0 1/min: 1100 5th speed Charge press. hPa: 1000
Del.quantity cm3/: 1000H.: (57,0...67,0)
6th speed 1/min: 1050 Inspection-pump test specifications Test specifications in parentheses Charge press. hPa: 1000
Del.quantity cm3/: 76,5...79,5
1000H.: (75,0...81,0)
7th speed 1/min: 900 Timing-device characteristic: 1/min: 500 1st speed Charge press. hPa: 1000 Charge press. hPa: 1000
Del.quantity cm3/: 82.0...85.0
1000H.: (80.5...86.5)
8th speed 1/min: 750 mm: 1,7...2,5 mm: (1,4...2,8) TD travel 1/min: 750 2nd speed Charge press. hPa: 1000 Charge press. hPa: 1000
Del.quantity cm3/: 1000H: (87,0...93,0)
9th speed 1/min: 500 TD travel mm: mm: (2,9...4,3) 1/min: 1050 3rd speed Charge press. hPa: 1000 mm: 4,7...5,5 mm: (4,4...5,8) Charge press. hPa: 1000 Del.quantity cm3/: 91,0...99,0 TD travel 1000H: -1/min: 500 Supply-pump pressure characteristic: 10th speed Charge press. hPa: -

C13

```
Del.quantity cm3/: -
              1000H: (61,0...67,0)
Zero delivery (stop):
Mech. shutoff:
              1/min: -
Speed
Del.quantity cm3/: - 1000H.
Electr. shutoff:
              1/min: 375
Speed
Del.quantity cm3/: - 1000H.
                             ALL STREET
Idle delivery:
              1/min: 375
1st speed
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed
              1/min: 450
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delivery:
1st speed
              1/min: 130
Del.quantity cm3/: -
              1000H: 60,0
 ind.
2nd speed
              1/min: 230
Del.quantity cm3/: -
              1000H: 60,0
 ax.
Shutoff electromagnet:
Cut-in
                    : 10,0
min. voltage
Rated voltage
                    : 12,0
Mounting and assembly dimensions:
Designation
               mm
                   : 5,1...5,4
: 1,1..1,35
: 2,2
KF
               mm
MS
               min
SVS max.
               mm
                   : 20,2...22,2
XK
               mm
                   : 11,9...15,3
XL
               mm
Remarks:
Correction at adjusting nut (46)
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : CUM 5,9 D1 Edition : 12.12.86 : 4.85 replaces : ISO 4113 Calibrating oil : VE 6/12F1050 R159-4 Injection pump : 0 460 426 044 Type number Customer-specific information Customer : CUMMINS Engine : 6BT-5.9 Power k: 76 Speed 1/mi: 2100 TEST BENCH REQUIREMENTS Calibrating-oil return temp. OC with thermometer : 40...48 : 42...50 electronically Inlet press., bar : 0.2 Calibrating nozzle-holder : 1 688 901 016 assembly Opening pressure bar: 207...210 Perforated-plate mm: 0.5 diameter Test inj. tubing : 1 680 750 017 Outside diameter x Wall thickness : 2 mm: 840 x Length Start of delivery mm : 0,3 Prestroke (from BDC): +-0.02(0.04)Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 750 Speed

Setting value mm: 3,6...4,0 Supply-pump pressure:

1/min: 750 Speed Setting value bar: 4,2...4,8 Full-load del. w/out charge press.: Speed 1/min : 900 Del.quantity cm3/ 1000H.: 83.0...84.0 Dispersion cm3/: 4.0 1000H.: (4,5) Low-idle speed regulation: 1/min: 375 Speed Del.quantity cm3/ 1000H.: 22,0...28,0 Full-load speed regulation: Speed 1/min: 1125 Deliquantity cm3/ 1000H: 36_0...44_0 Start: Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 97,0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 500 mm: 1,8...2,6 mm: (1,5...2,9) 1/min: 750 TD travel 2nd speed TD travel mm: mm: (3,1...4,5) 1/min: 900 3rd speed mm: 4,6...5,4 mm: (4,3...5,7) TD travel Supply-pump pressure characteristic: 1/min: 500 1st speed Supply-pump bar: 3,0...3,6 pressure 1/min: 900 2nd speed Supply-pump pressure bar: 4.7...5.3 Overflow quantity at overflow valve: 1/min: 500 1st speed Oveflow | : 41...83 cm3/10s: (26...98) 1/min: 1050 quantity 2nd speed

```
: 55...138
Overflow
 quantity cm3/10s: (40...153)
Delivery-quant. and breakaway char.:
1st speed
                1/min: 1175
Del.quantity cm3/: -
1000H.: 0...1,5
3rd speed 1/min: 1125
Del.quantity cm3/: 36,0...44,0
1000H.: (35,0...45,0)
                1/min: 1050
4th speed
Del.quantity cm3/: 78,5...81,5
1000H.: (77,0...83,0)
                1/min: 900
5th speed
Del.quantity cm3/: -
1000H.: (80,5...86,5)
6th speed 1/min: 750
Del.quantity
                 cm3/: 83,5...87,5
               1000H.: (81,8...89,2)
                1/min: 500
7th speed
Del.quantity cm3/: 84,0...88,0
1000H.: (82,3...89,7)
Zero delivery (stop):
Mech. shutoff:
                1/min: -
Speed
Del.quantity cm3/: - 1000H.
Electr. shutoff:
                1/min: 375
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
                1/min: 300
Del.quantity cm3/: 45,0..53,0
1000H.: (44,0..54,0)
2nd speed 1/min: 375
Del.quantity cm5/: -
1000H.: (20,0..30,0)
                1/min: 450
3rd speed
Del.quantity cm3/: -
1000H.: 0...1,5
Automatic starting fuel delivery:
                1/min: 130
1st speed
Del.quantity cm3/: -
                1000H: 97,0
 ind.
2nd speed
                1/min: 200
Del. cantity cm3/: -
                1000H: 85,0
Shutoff electromagnet:
```

Cut-in min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : KF mm : 5,2...5,5
MS mm : 1,4...1,6
SVS max. mm : 0,8
XK mm : 20,2...22,2
XL mm : 10,7...14,1

Note inst. in remarks column

Test sheet : CUM 5.9 L Edition : 10.12.86 replaces : 1.85 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R173-3
Type number : 0 460 426 058

: 0 460 426 058 Type number

Customer-specific information Customer : CUMMINS

: 6BTA 5,9 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 016 assembly

Opening -

pressure bar : 207...210

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900 Charge press. hPa: 750 Setting value mm: 2,0...2,4

Supply-pump pressure:

1/min: 900 Charge press. hPa: 750

```
Setting value bar: 4,1...4,7
                                                       Charge press. hPa: 750
                                                       Supp Ty-pump
                                                                     bar: 1,1...1,7
1/min: 750
Full-load del. with charge press.:
                                                        pressure
                                                       2nd speed
                                                       Charge press. hPa: 750
              1/min: 750
Speed
Charge press. hPa: 750
                                                       Supply-pump
                                                                       bar: 3,6...4,2
               cm3/
Del quantity
                                                        pressure
             1000H.: 91,0...92,0
                                                       3rd speed
                                                                     1/min: 1050
              cm3/: 4.0
                                                                      hPa: 750
Dispersion
                                                       Charge press.
             1000H : (4,5)
                                                       Supply-pump
                                                        pressure
                                                                       bar: 4,8...4,7
Full-load del. w/out charge press.:
                                                       Overflow quantity at overflow valve:
             1/min : 500
Speed
                                                                     1/min: 500
: 55...138
Deliquantity cm3/
                                                       1st speed
             1000H.: 66,0...67,0
                                                       Oveflow
                                                        quantity
                                                                   cm3/10s: (40...153)
Low-idle speed regulation:
                                                       2nd speed
                                                                     1/min: 1050
                                                       Overflow
                                                                           : 55...138
                                                        quantity cm3/10s: (40...153)
              1/min: 375
Speed
Charge press. hPa: -
                                                       Delivery-quant. and breakaway char.:
              cm3/
Del.quantity
             10GOH.: 20,5...26,5 cm3/: 3,5
                                                       1st speed
                                                                    1/min: 600
Dispersion
                                                       Charge-air pressure-setting
             1000H.: (4,5)
                                                        point
                                                                       hPa: 400
                                                                        mm: 6,2
Full-load speed regulation:
                                                       LDA stroke
                                                       Del.quantity cm3/: 82,5...83,5
                                                                    1000H.: (80,0...86,0)
              1/min: 1100
Speed
Charge press. hPa: 750
                                                                     1/min: 1170
                                                       2nd speed
                                                       Charge press. hPa: 750
Del.quantity
              cm3/
                                                      Del.quantity cm3/: -
1000H.: 0...1,5
              1000H: 64,5...70,5
Start:
                                                                     1/min: 1160
                                                       3rd speed
                                                       Charge press. hPa: 750
                                                      Del.quantity cm3/: -
1000H.: 0...15
Speed
              1/min: 100
Del.quantity mind.
         cm3/1000H.: 97.0
                                                                     1/min: 1120
                                                       4th speed
                                                      Charge press. hPa: 750
Del.quantity cm3/: -
1000H.: 0..15,0
Inspection-pump test specifications
Test specifications in parentheses
                                                                     1/min: 1100
                                                       5th speed
                                                       Charge press. hPa: 750
                                                       Del.quantity cm3/: -
1000H.: (62,5...72,5)
Timing-device characteristic:
                                                       6th speed
                                                                     1/min: 1050
              1/min: 750
1st speed
                                                      Charge press. hPa: 750
Del.quantity cm3/: 78,5...81,5
1000H.: (77,0...83,0)
                hPa: 750
Charge press.
                  mm: 1,3...2,1
mm: (1,0...2,8)
TD travel
              1/min: 900
                                                       7th speed
                                                                     1/min: 900
2nd speed
                                                       Charge press. hPa: 750
Charge press. hPa: 750
                                                      Del.quantity cm3/: 85,5...88,5
1000H.: (84,0...90,0)
TD travel
                 mm:
              mm: (1,5...2,9)
1/min: 1050
                                                                     1/min: 750
3rd speed
                                                       8th speed
                                                       Charge press. hPa: 750
                hPa: 750
                                                      Charge press. ...
Del.quantity cm3/: -
1000H: (88,5...94,5)
Charge press.
                 mm: 2,7...3,3
mm: (2,3...3,6)
TD travel
                                                                     1/min: 500
                                                       9th speed
                                                       Charge press. hPa: 750
Supply-pump pressure characteristic:
                                                       Del.quantity cm3/: 102,0...106,0
                                                                     1000H: (100,3...107,7)
1st speed
              1/min: 200
C18
```

```
1/min: 500
10th speed
Charge press. hPa: -
Del.quantity cm3/: -
              1000H: (63,5...69,5)
Zero delivery (stop):
Mech. shutoff:
Speed
              1/min: -
Deliquantity cm3/: - 1000H.
Electr. shutoff:
              1/min: 375
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
              1/min: 375
1st speed
Del.quantity cm3/: -
1000H.: (18,5..28,5)
2nd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...1,5
Automatic starting fuel delivery:
             1/min: 130
1st speed
Del.quantity cm3/: -
              1000H: 85,0
 ind.
2nd speed
              1/min: 230
Del.quantity cm3/: -
              1000H: 85,0
Shutoff electromagnet:
Cut-in
                   : 10,0
min. voltage
                   : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
               mm
                   5,2...5,5
: 1,4...1,6
: 1,2
KF
               mm
MS
               mm
SVS max.
               mm
Remarks:
Correction at adjusting nut (46)
```

```
BOSCH-INJ.-PUMP TEST SPECIFICATIONS
                                                               1/min: 750
                                                  Speed
                                                  Charge press. hPa: 800
                                                  Setting value bar: 3,3...3,9
Note inst. in remarks column
                 : CUM 5,9 L1
Test sheet
                                                  Full-load del. with charge press.:
Edition
                  : 10.12.86
replaces
                                                                1/min: 750
                                                  Speed
                                                  Charge press. hPa: 800
Calibrating oil
                  : ISO 4113
                                                  Del.quantity cm3/
1000H.: 82,5...83,5
Injection pump
                  : VE 6/12F1250 R173-4
Type number
                   : 0 460 426 060
                                                               cm3/:4.0
                                                  Dispersion
                                                               1000H : (4,5)
Customer-specific information
Customer
                  : CUMMINS
                                                  Full-load del. w/out charge press.:
Engine
                  : 6BTA-5.9
                                                  Speed
                                                               1/min : 500
                                                  Del.quantity cm3/
1000H.: 37,0...38,0
                 k: 132
Power
              1/mi: 2500
Speed
                                                  Low-idle speed regulation:
TEST BENCH REQUIREMENTS
                                                  Speed
                                                                1/min: 365
Calibrating-oil oC
                                                  Charge press. hPa: -
                                                  Del.quantity cm3/
1000H.: 8,0...14,0
return temp.
with thermometer : 40...48
                                                                 cm3/:
electronically
                  : 42...50
                                                  Dispersion
                                                               1000H .: 5,5
Inlet press., bar : 0.2
                                                  Full-load speed regulation:
Calibrating nozzle-holder
                                                                1/min: 1300
                  : 1 688 901 027
 assembly
                                                  Charge press. hPa: 800
                                                  Del.quantity cm3/
                                                               1000H: 59,0...65,0
Opening
              bar: 250...253
 pressure
                                                  Start:
Perforated-plate
 diameter
             mm : 0.5
                                                               1/min: 100
                                                  Speed
                                                  Del.quantity mind.
                                                          cm3/1000H.: 60,0
Test inj. tubing : 1 680 750 017
                                                  Inspection-pump test specifications
                                                  Test specifications in parentheses
Outside diameter
x Wall thickness
x Length
                                                  Timing-device characteristic:
Start of delivery
Prestroke
               mm: 0.3
                                                               1/min: 600
                                                  1st speed
                                                  Charge press. hPa: 800
        (from BDC): +-0.02(0.04)
                                    TD travel
                                                                  mm: 0,4...1,2
                                                                  mm: (0,1...1,5)
Injection-pump setting values
Test specifications in parentheses
                                                               1/min:
                                                                       750
                                                  2nd speed
                                                  Charge press. hPa: 800
                                                  TD travel
Timing-device travel:
                                                                  mm:
                                                                  mm: (0,9...2,3)
                                                               1/min: 1050
             1/min: 750
                                                  3rd speed
Speed
Charge press. hPa: 800
                                                  Charge press. hPa: 800
                                                                  mm: 2,2...3,0
mm: (1,9...3,3)
Setting value mm: 1,4...1,8
                                                  TD travel
Supply-pump pressure:
```

C20

Supply-pump pressure characteristic:	10th speed 1/min: 500 Charge press. hPa: -
1st speed 1/min: 500 Charge press. hPa: 800 Supply-pump	Del.quantity cm3/: - 1000H: (34,540,5)
pressure bar: 2,22,8 2nd speed 1/min: 1050	Zero delivery (stop):
Charge press. hPa: 800	Mech. shutoff:
Supply-pump pressure bar: 4,45,0	Speed 1/min: - Del.quantity cm3/: - 1000H.
Overflow quantity at overflow valve:	
1st speed 1/min: 500 Charge press. hPa: -	Electr. shutoff: Speed 1/min: 375 Del.quantity cm3/: -
Oveflow : 4183 quantity cm3/10s: (2698)	1000H.
2nd speed 1/min: 1250	Idle delivery:
Charge press. hPa: 800 l Overflow : 55138 l	1st speed 1/min: 375
quantity cm3/10s: (40153)	Del.quantity cm3/: -
	1000H.: (6,016,0)
Delivery-quant. and breakaway char.:	2nd speed 1/min: 500 Del.quantity cm3/: -
Charge-air pressure-setting I	1000H.: 04,0
point hPa: 400	Automatic stanting fuel delivery
Del.quantity cm3/: 69,570,5 1000H.: (67,073,0)	Automatic starting fuel delivery:
2nd speed 1/min: 1400	1st speed 1/min: 200
Charge press. hPa: 800	Del.quantity cm3/: - ind. 1000H: 60,0
1000H.: 03,0	·
3rd speed 1/min: 1370	2nd speed 1/min: 350
Charge press. nPa: 800 Del.quantity cm3/: -	Del.quantity cm3/: - ax. 1000H: 60,0
1000H.: 015,0	
4th speed 1/min: 1340 Charge press. hPa: 800	Shutoff electromagnet:
Del.quantity cm3/: -	Cut-in
1000H.: 015,0	min. voltage : 10,0
5th speed 1/min: 1300	Rated voltage : 12,0
Del.quantity cm3/: -	Mounting and assembly dimensions:
1000H.: (57,067,0) 6th speed 1/min: 1250	Designation
Charge press. hPa: 800	K mm : -
Del.quantity cm3/: 76.079.0	KF mm : 5,15,4 MS mm : 1,31,55
1000H.: (74,580,5)	MS mm : 1,31,55 XK mm : 20,222,2
Charge press. hPa: 800	XL mm : 11,915,3
Deliquantity cm3/: 79,5,82,5 1000H.: (78,084,0)	Remarks:
8th speed 1/min: 750	
Charge press. hPa: 800	
Del.quantity cm3/: - 1 1000H: (80,086,0)	
9th speed 1/min: 500	
Charge press. hPa: 800 Deliquantity cm3/: 83,591,5	
1000H: (83,891,2)	

Note inst. in remarks column

Test sheet : CUM 5.9 P Edition : 12.12.86 replaces : 9.85 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R159-15 Type number : 0 460 426 064

Customer-specific information Customer : CUMMINS

Engine : 6BT-5,9

k: 69 Power Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly `

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850 Setting value mm: 3,8...4,2

Supply-pump pressure:

```
Speed 1/min: 850
Setting value bar: 3,9...4,5
                                                          2nd speed
Overflow
                                                                         1/min: 1400
                                                                              : 55...138
                                                           quantity cm3/10s: (40...153)
Full-load del. W/out charge press.:
                                                          Delivery-quant. and breakaway char.:
              1/min : 1100
                                                          1st speed
Speed
                                                                         1/min: 1580
                                                          Del.quantity cm3/: -
1000H.: 0...2,0
Del.quantity cm3/
              1000H.: 56,5...57,5
                                                         3rd speed 1/min: 1520
Del.quantity cm3/: 8.5...12.5
1000H.: (7.5...13.5)
4th speed 1/min: 1470
                cm3/: 4,0
Dispersion
              1000H.: (4,5)
Low-idle speed regulation:
                                                          Del.quantity cm3/: -
1000H.: (30,0...40,0)
               1/min: 375
Speed
Deliquantity cm3/
                                                                         1/min: 1400
                                                          5th speed
              1000H.: 8,0...14,0
                                                         Del.quantity cm3/: 53,5...56,5
1000H:: (52,0...58,0)
Dispersion
                cm3/: 5,5
              1000H.: -
                                                                         1/min: 1100
                                                          6th speed
                                                         Del.quantity cm3/: -
1000H.: (54.0...60.0)
7th speed 1/min: 850
Full-load speed regulation:
Speed
               1/min: 1470
                                                         Del.quantity cm3/: 52.5...56.5
1000H.: (50.8...58.2)
Del.quantity cm3/
               1000H: 32,0...38,0
                                                                         1/min: 500
                                                          8th speed
                                                          Del.quantity cm3/: 39,0...47,0
Start:
                                                                         1000H: (39,3...46,7)
Speed
               1/min: 100
Del.quantity mind.
                                                          Zero delivery (stop):
         cm3/1000H.: 50,0
                                                          Mech. shutoff:
Inspection-pump test specifications
                                                          Speed
                                                                         1/min: -
                                                         Del.quantity cm3/: - 1000H.
Test specifications in parentheses
Timing-device characteristic:
                                                          Electr. shutoff:
                                                                         1/min: 375
                                                          Speed
                                                         Del.quantity cm3/: - 1000H.
               1/min: 500
1st speed
                   mm: 1,5...2,3
mm: (1,2...2,6)
TD travel
               1/min: 850
                                                          Idle delivery:
2nd speed
TD trave!
                   mm: -
                  mm: (3,3...4,7)
                                                          1st speed
                                                                         1/min: 300
                                                         Del.quantity cm3/: 41,0..49,0
1000H.: (40,0..50,0)
2nd speed 1/min: 375
               1/min: 1100
3rd speed
                  mm: 5,4...6,2
mm: (5,1...6,5)
TD travel
                                                          2nd speed
                                                         Del.quantity cm3/: -
1000H.: (6,0...16,0)
Supply-pump pressure characteristic:
                                                          3rd speed
                                                                         1/min: 450
                                                         Del.quantity cm3/: -
1000H.: 0...4,0
               1/min: 500
1st speed
Supply-pump
                 bar: 2,5...3,1
 pressure
               1/min: 1100
                                                         Automatic starting fuel delivery:
2nd speed
Supply-pump
 pressure
                 bar: 4,9...5,5
                                                                         1/min: 130
                                                          1st speed
                                                         Del.quantity cm3/:
Overflow quantity at overflow valve:
                                                                         1000H: 60,0
                                                           ind.
               1/min: 500
                                                                         1/min: 400
1st speed
                                                         2nd speed
Oveflow
                     : 41...83
                                                         Del.quantity cm3/: -
 quantity cm3/10s: (26...98)
                                                                         1000H: 60,0
                                                           âx.
C23
```

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm :
KF mm : 5,1...5,4

MS mm : 1,4...1,6

SVS max. mm : 0,8

XK mm : 20,2...22,2

XL mm : 10,8...14,2

Note inst. in remarks column

Test sheet : CUM 5.9 P1 Edition : 16.10.86 replaces : -

Calibrating oil : ISO-4113

Injection pump Type number : VE 6/12F1250 R159-16

: 0 460 426 066

Customer-specific information Customer : CUMMINS

: 6 BT-59 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 0,3 (from BDC): +/-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750 Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750

Setting value bar: 3,5...4,1

MARKE

Full-load del. w/out charge press.:	<pre>Delivery-quant. and breakaway char.:</pre>
	l 1st speed 1/min: 1400
Speed 1/min : 1100	<pre>Del.quantity cm3/: -</pre>
Del.quantity cm3/	1 1000H.: 03,0
1000H.: 68,569,5	1 3rd speed 1/min: 1390
Dispersion cm3/: 4,0	Del.quantity cm3/: -
1000H.: -	1 1000H.: 0.4.15,0
	1 4th speed 1/min: 1350
Low-idle speed regulation:	1 Del.quantity cm3/: -
	1 1000H.: 015,0
Speed 1/min: 350	I 5th speed 1/min: 1300
Del.quantity cm3/	Del.quantity cm3/: -
1000H.: 20,529,5	1 1000H.: (50,060,0)
Dispersion cm3/: 5,5	1 6th speed 1/min: 1250
1000H.: -	Del.quantity cm3/: 65,768,7
Full-load speed regulation:	1000H.: (64,2/0,2)
01	7th speed 1/min: 1100
Speed 1/min: 1300	Del.quantity cm3/: - 1000H.: (66,072,0)
Del.quantity cm3/	10004.: (66,0/2,0)
1000H: 52,058,0	I 8th speed 1/min: /5U
Charte	Del.quantity cm3/: 68,572,5
Start:	1000H: (67,573,3)
Second 1/win 400	9th speed 1/min: 500
Speed 1/min: 100	Del.quantity cm3/: 51,058,0
Del.quantity mind.	1000H: -
cm3/1000H.: 60,0	Tono dolivony (cton):
Incompation - numer took promisions	Zero delivery (stop):
Inspection-pump test specifications	I Mach chutaff:
Test specifications in parentheses	Mech. shutoff:
	Speed 1/min: -
Timina-davias shansateristics	l Del.quantity cm3/: - l 1000H.
Timing-device characteristic:	i iooon,
1st speed 1/min: 500	Electr. shutoff:
TD travel mm: 1,52,3	I Speed 1/min: 375
2nd speed 1/min: 750	Del.quantity cm3/: -
TD trayel mm: -	1 1000H.
mm: (2,94,3)	
3rd speed 1/min: 1100	I Idle delivery:
TD travel mm: 5,26,0	1
mm: (4,96,3)	1 1st speed 1/min: 350
	Del.quantity cm3/: -
Supply-pump pressure characteristic:	1000H.: (20,030,0)
The state of the s	1 2nd speed 1/min: 375
1st speed 1/min: 500	Del.quantity cm3/: 8,014,0
Supply-pump	1000H.: (6,016,0)
pressure bar: 2,43,0	I 3rd speed 1/min: 450
2nd speed 1/min: 1100	1 Del.quantity cm3/: -
Supply-pump	1 1000H.: 04,0
pressure bar: 4,85,4	
	Automatic starting fuel delivery:
Overflow quantity at overflow valve:	
	I 1st speed 1/min: 130
1st speed 1/min: 500	<pre>Del.quantity cm3/: -</pre>
Oveflow : 4183	I ind. 1000H: 60,0
quantity cm3/10s: (2698)	1
2nd speed 1/min: 1250	I 2nd speed 1/min: 240
Overflow : 55138	<pre>Del.quantity cm3/: -</pre>
quantity cm3/10s: (40153)	1 ax. 1000H: 60,0
	I

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : KF mm : 5,1...5,4
MS mm : 0,9..1,15
SVS max. mm : 1,2
XK mm : 18,8...20,8
XL mm : 11,8...15,2

Note inst. in remarks column

Test sheet : CUM 5,9 S Edition replaces : 11.12.86 : 10.85 Calibrating oil : ISO 4113

Injection pump Type number : VE 6/12F1150 R225-4

: 0 460 426 071

Customer-specific information Customer : CUMMINS

Engine : 6BT-5,9

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 9,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750 Setting value mm: 3,4...3,8

Supply-pump pressure:

1/min: 750

Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:	2nd speed 1/min: 1150 Overflow : 55138
Speed 1/min: 900 l Del.quantity cm3/	quantity cm3/10s: (40153)
1000H.: 71,572,5	Delivery-quant. and breakaway char.:
Dispersion cm3/: 4,0	1st speed 1/min: 1300
1000H.: (4,5)	Del.quantity cm3/: -
1	Del.quantity cm3/: - 1000H.: 02,0
Low-idle speed regulation:	3rd speed 1/min: 1260
Low rate speed regulation.	hal guestitu an7/4 m
Conn.d. 1/min. 775	Del.quantity cm3/: - 1000H.: 015,0
Speed 1/min: 375	10001.: 015,0
Del.quantity cm3/	4th speed 1/min: 1220
1000H.: 8,014,0	Del.quantity cm3/: - 1000H.: 015,0
Dispersion cm3/: 5,5	1000H.: 015,0
1000H.: -	5th speed 1/min: 1190
Full-load speed regulation:	Del.quantity cm3/: -
	1000H.: (48,058,0)
Speed 1/min: 1190	6th speed 1/min: 1150
Del.quantity cm3/	
1000H: 50,056,0	Del.quantity cm3/: 66,569,5 1000H.: (65,071,0)
100011. 30,00.1.30,00	7th coad 1/min 000
Chants	7th speed 1/min: 900
Start:	Del.quantity cm3/: - 1000H.: (69,075,0)
00004	1000n.: (09,0(3,0)
Speed 1/min: 100	8th speed 1/min: 750
Del.quantity mind.	Del.quantity cm3/: 71,075,0
cm3/1000H.: 60,0	1000H: (69,376,7)
	9th speed 1/min: 500
Inspection-pump test specifications	Del.quantity cm3/: 58,066,0
Test specifications in parentheses	1000H: (58,365,7)
l i	Zero delivery (stop):
Timing-device characteristic:	
	Mech. shutoff:
1st speed 1/min: 500	Speed 1/min: -
TD travel mm: 1,52,3	Del.quantity cm3/: -
	1000H.
mm: (1,22,6)	100011.
	Clocks churchfi
TD travel mm: -	Electr. shutoff:
mm: (2,94,3)	Speed 1/min: 375
3rd speed 1/min: 1100	vel.quantity cm5/: ~
1 113 mm at a 1	***************************************
TD travel mm: 5,26,0	Del.quantity cm3/: - 1000H.
mm: (4,96,3)	
mm: (4,96,3)	1000H. Idle delivery:
mm: 3,26,0 mm: (4,96,3)	Idle delivery:
mm: (4,96,3) Supply-pump pressure characteristic:	Idle delivery: 1st speed 1/min: 375
mm: (4,96,3)	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: -
Supply-pump pressure characteristic: 1st speed 1/min: 200	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0)
mm: (4,96,3) Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0)
supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450
supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: -
supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0	Idle delivery: 1st speed
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: -
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery:
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery: 1st speed 1/min: 130
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump pressure bar: 4,85,4	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: -
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery: 1st speed 1/min: 130
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump pressure bar: 4,85,4 Overflow quantity at overflow valve:	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: - ind. 1000H: 70,0
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump pressure bar: 4,85,4 Overflow quantity at overflow valve: 1st speed 1/min: 500	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: - ind. 1000H: 70,0 2nd speed 1/min: 240
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump pressure bar: 4,85,4 Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 4183	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: - ind. 1000H: 70,0 2nd speed 1/min: 240 Del.quantity cm3/: -
Supply-pump pressure characteristic: 1st speed 1/min: 200 Supply-pump pressure bar: 0,91,5 2nd speed 1/min: 500 Supply-pump pressure bar: 2,43,0 3rd speed 1/min: 1100 Supply-pump pressure bar: 4,85,4 Overflow quantity at overflow valve: 1st speed 1/min: 500	Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: - 1000H.: (6,016,0) 2nd speed 1/min: 450 Del.quantity cm3/: - 1000H.: 04,0 Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: - ind. 1000H: 70,0 2nd speed 1/min: 240

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation K KF mm mm : 5,2...5,4 mm : 0,9...1,1 mm : 1,0 mm : 20,2...22,2 mm : 11,5...14,9 MS SVS max.

XK XL

Note inst. in remarks column

Test sheet : CUM 5,9 \$2 Fdition : 11.12.86 Edition replaces : 11.12.86

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R225-6 Type number : 0 460 426 073

Customer-specific information : CUMMINS Customer

Engine : 6BT-5.9

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

bar : 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750

Setting value bar: 3,5...4,1

```
Full-load del. w/out charge press.:
                                                                        1/min: 1300
                                                         1st speed
                                                        Del.quantity cm3/: -
1000H.: 0...3,0
              1/min : 1100
Del.quantity cm3/
                                                         3rd speed
                                                                        1/min: 1270
              1000н.: 58,0...59,0
                                                        Del.quantity cm3/: 17.5...29.5
1000H.: (18.5...28.5)
4th speed 1/min: 1240
Dispersion
                cm3/: 4,0
              1000H.: (4,5)
                                                        Del.quantity cm3/: -
1000H.: (40,5...50,5)
Low-idle speed regulation:
                                                                        1/min: 1200
                                                         5th speed
                                                        Del.quantity cm3/: 56.0...59.0
1000H.: (54.5...60.5)
6th speed 1/min: 1100
Speed
               1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
                                                        Del.quantity cm3/: -
1000H.: (55,5...61,5)
7th speed 1/min: 750
Full-load speed regulation:
               1/min: 1240
Speed
                                                        Del.quantity cm3/: 56.0...60.0
1000H.: (54.3...61.7)
Del.quantity cm3/
               1000H: 42,5...48,5
                                                                        1/min: 500
                                                         8th speed
                                                        Del.quantity cm3/: 48,5...56,5
Start:
                                                                       1000H: (48,8...56,2)
               1/min: 100
Speed
Del.quantity mind.
                                                        Zero delivery (stop):
         cm3/1000H.: 50.0
                                                        Mech. shutoff:
                                                                       1/min: -
Inspection-pump test specifications
                                                         Speed
                                                        Del.quantity cm3/: - 1000H.
Test specifications in parentheses
Timing-device characteristic:
                                                        Electr. shutoff:
                                                                       1/min: 375
                                                        Speed
                                                        Del.quantity cm3/: - 1000H.
               1/min: 500
1st speed
TD travel
                  mm: 1,5...2,3
                  mm: (1,2...2,6)
2nd speed
               1/min: 750
                                                         Idle delivery:
TD travel
                  min:
                  mm: (2,9...4,3)
                                                                       1/min: 350
                                                        1st speed
                                                        Del.quantity cm3/: 23.0..31.0
1000H.: (22.0..32.0)
2nd speed 1/min: 375
               1/min: 1100
3rd speed
TD travel
                  mm: 5,2...6,0
                  mm: (4,9...6,3)
                                                        Del.quantity cm3/: -
1000H.: (6,0...16,0)
Supply-pump pressure characteristic:
                                                                       1/min: 500
                                                         3rd speed
                                                        Del.quantity cm3/: -
1000H.: 0...4,0
               1/min: 500
1st speed
Supply-pump
               bar: 2,4...3,0
1/min: 1100
 pressure
                                                        Automatic starting fuel delivery:
2nd speed
Supply-pump
                 bar: 4,8...5,4
                                                        1st speed
                                                                       1/min: 130
 pressure
                                                        Del.quantity cm3/: -
Overflow quantity at overflow valve:
                                                                       1000H: 60,0
                                                          ind.
               1/min: 500
1st speed
                                                        2nd speed
                                                                       1/min: 400
Oveflow
                    : 41...83
                                                        Del.quantity cm3/: -
                                                                       1000H: 50,0
            cm3/10s: (26...98)
 quantity
               1/min: 1200
2nd speed
Overflow
                    : 55..138
                                                        Shutoff electromagnet:
 quantity cm3/10s: (40...153)
                                                        Cut-in
                                                                             : 10.0
                                                         min. voltage
Delivery-quant. and breakaway char.:
D04
```

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation K KF MS SVS max. XK XL mm : 5.1...5.4 mm : 1.3..1.55 mm : 1.6 mm : 20.2...22.2 mm : 11.1...14.5

Note inst. in remarks column

Test sheet : CUM 5,9 83 Edition replaces : 11.12.86

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R225-10 Type number : 0 460 426 076

Customer-specific information : CUMMINS Customer

: 6BT-5.9 Engine

k: 89 Power 1/mi: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly ` : 1 688 901 027

Opening |

bar : 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test in i. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,3...3,7

Supply-pump pressure:

1/min: 750 : 55..138 Overflow quantity cm3/10s: (40...153) Setting value bar: 4,0...4,6 Full-load del. w/out charge press.: Delivery-quant. and breakaway char.: 1st speed 1/min: 1200 Del.quantity cm3/: -1000H.: 0...2,0 1/min : 750 Speed Del.quantity cm3/ 1000H.: 59,5...60,5 1/min: 1160 3rd speed Del.quantity cm3/: -1000H.: 0...15,0 cm3/: 4,0 Dispersion 1000H.: (4,5) 4th speed 1/min: 1130 Del.quantity cm3/: -1000H.: 0...15,0 Low-idle speed regulation: 5th speed 1/min: 1100
Del.quantity cm3/: 42.0...48.0
1000H.: (40.0...50.0)
6th speed 1/min: 1050 Speed 1/min: 375 Del.quantity cm3/ 1000H.: 8,0...14,0 Full-load speed regulation: Del.quantity cm3/: 57.2...60.2 1000H: (55.7...61.7) Speed 1/min: 1100 Del.quantity cm3/ 1/min: 900 7th speed Del.quantity cm3/: 58.6...61.6 1000H.: (57.1...63.1) 8th speed 1/min: 750 1000H: 42,0...48,0 Start: Del.quantity cm3/: 1000H: (57,0...63,0) 9th speed 1/min: 500 Del.quantity cm3/: 53,0...61,0 1000H: (53,3...60,7) Speed 1/min: 100 Deliquantity mind. cm3/1000H.: 70,0 Inspection-pump test specifications Test specifications in parentheses Zero delivery (stop): Mech. shutoff: Timing-device characteristic: Speed 1/min: -Del.quantity cm3/: - 1000H. 1/min: 500 1st speed TD travel mm: 1,4,..2,2 mm: (1,1...2,5)Electr. shutoff: 1/min: 750 1/min: 375 2nd speed Speed Del.quantity cm3/: - 1000H. TD travel mm: mm: (2,8...4,2) 1/min: 1050 3rd speed TD travel mm: 5,5...6,3 Idle delivery: mm: (5,2...6,6)1/min: 350 1st speed Del.quantity cm3/: 17,0..26,0 Supply-pump pressure characteristic: 1000H.: (16,5..26,5) 1/min: 375 1st speed 1/min: 500 2nd speed Del.quantity cm3/: -1000H.: (6,0...16,0) 3rd speed 1/min: 500 Supply-pump bar: 2,9...3,5 pressure 1/min: 1050 2nd speed Del.quantity cm3/: -1000H.: 0...4,0 Supply-pump bar: 5,3...5,9 pressure Automatic starting fuel delivery: Overflow quantity at overflow valve: 1/min: 500 1/min: 130 1st speed 1st speed : 41...83 cm3/: -Oveflow Del.quantity cm3/10s: (26...98) 1/min: 1050 1000H: 70,0 quantity ind. 2nd speed 1/min: 300 2nd speed

Del.quantity cm3/: ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : KF mm : 5,1...5,4
MS mm : 1,3..1,55
SVS max. mm : 1,6
XK mm : 18,8...20,8
XL mm : 12,1...15,5

Note inst. in remarks column

Test sheet : CUM 5.9 \$4 Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R225-11 Type number : 0 460 426 080

Customer-specific information Customer : CUMMINS

: 6BT-5,9 Engine

k: 65 Power 1/mi: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

pressure bar : 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,3...3,7

Supply-pump pressure:

```
Speed
                                                                    1/min: 500
             1/min: 750
                                                      1st speed
Setting value bar: 3,5...4,1
                                                                         : 41...83
                                                      Oveflow
                                                                  cm3/10s: (26...98)
1/min: 1000
                                                       quantity -
Full-load dei. w/out charge press.:
                                                      2nd speed
                                                      Over flow
                                                                         : 55...138
                                                       quantity cm3/10s: (40...153)
Speed
             1/min: 900
Del.quantity cm3/
             1000H.: 47,5...48,5
                                                      Delivery-quant. and breakaway char.:
               cm3/: 4,0
                                                      1st speed
                                                                   1/min: 1100
Dispersion
                                                      Del.quantity 6m3/: -
1000H.: 0...2,0
             1000H.: (4,5)
Low-idle speed regulation:
                                                      3rd speed
                                                                    1/min: 1090
                                                      Del.quantity cm3/: -
1000H.: 0...15,0
Speed
              1/min: 375
Del.quantity cm3/
                                                                    1/min: 1060
                                                      4th speed
                                                      Del.quantity cm3/: -
1000H.: 0...15,0
             1000H.: 8,0...14,0
               cm3/: 5,5
Dispersion
                                                                    1/min: 1050
             1000H.: -
                                                      5th speed
                                                      Del.quantity cm3/: -
1000H.: (28,0...38,0)
Full-load speed regulation:
Speed
              1/min: 1050
                                                                    1/min: 1000
                                                      6th speed
                                                      Del.quantity cm3/: 44.5...47.5
1000H.: (43.0...49.0)
Del.quantity cm3/
              1000H: 30,0...36,0
                                                                    1/min: 900
                                                      7th speed
Start:
                                                                   cm3/: -
                                                      Del.quantity
                                                                   1000H.: (45,0...51,0)
                                                      8th speed 1/min: 750
Del.quantity cm3/: 45.0...49.0
1000H: (43.3...50.7)
Speed
              1/min: 100
Del.quantity mind.
        cm3/1000H.: 40.0
                                                                    1/min: 500
                                                      9th speed
                                                      Del.quantity cm3/: 33,0...41,0
Inspection-pump test specifications
                                                                    1000H: (33,3...40,7)
Test specifications in parentheses
                                                      Zero delivery (stop):
Timing-device characteristic:
                                                      Mech. shutoff:
1st speed
              1/min: 500
                                                      Speed
                                                                    1/min: -
                                                      Del.quantity cm3/: - 1000H.
TD travel
                 mm: 1,1...1,9
                 mm: (0,8...2,2)
              1/min: 750
2nd speed
TD travel
                                                      Electr. shutoff:
                 mm:
              mm: (2,8...4,5)
1/min: 1000
                                                                    1/min: 375
                                                      Speed
                                                     Del.quantity cm3/: - 1000H.
3rd speed
TD travel
                 mm: 5,3...6,1
                 mm: (5,0...6,4)
                                                      Idle delivery:
Supply-pump pressure characteristic:
                                                                    1/min: 375
                                                      1st speed
                                                     Del.quantity cm3/: -
1000H.: (6,0...16,0)
              1/min: 200
1st speed
Supply-pump
                bar: 0,8...1,4
                                                      2nd speed
                                                                    1/min: 450
pressure
                                                     Del.quantity cm3/: -
1000H.: 0...4,0
2nd speed
              1/min: 500
Supply-pump
                bar: 2,4...3,0
pressure
3rd speed
              1/min: 1000
                                                      Automatic starting fuel delivery:
Supply-pump
                                                                    1/min: 200
pressure
                bar: 4,5...5,1
                                                      1st speed
                                                     Del.quantity cm3/: -
                                                                    1000H: 45,0
Overflow quantity at overflow valve:
                                                       ind.
```

2nd speed 1/min: 370 Del.quantity cm3/: -1000H: 50,0

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation K

mm : -

Note inst. in remarks column

Test sheet : PER 6.0 A Edition : 12.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R241 Type number : 0 460 426 085

Customer-specific information : PERKINS Customer

: T6.60 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening

pressure bar : 172...175

Perforated-plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1100 Charge press. hPa: 1000

```
Setting value bar: 7,2...7,8
                                                                              hPa: 1000
                                                            Charge press.
                                                            Supply-pump
                                                                           bar: 4,7...5,3
1/min: 1300
Full-load del. with charge press.:
                                                             pressure
                                                            2nd speed
                                                                              hPa: 1000
                1/min: 1000
Speed
                                                            Charge press.
Charge press. hPa: 1000
                                                            Supply-pump
Del.quantity cm3/
1000H:: 90.5...91.5
Dispersion cm3/: 3.5
                                                             pressure
                                                                              bar: 8,0...8,6
                                                            Overflow quantity at overflow valve:
                                                            1st speed 1/min: 500
Charge press. hPa: 1000
Full-load del. w/out charge press.:
                                                            Oveflow
                                                                                 : 41...138
                                                             quantity cm3/10s: (26...153)
Speed
               1/min : 700
                                                                        1/min: 1300
Del.quantity cm3/
                                                            2nd speed
               1000H.: 80,5...81,5
                                                            Charge press. hPa: 1000
                                                            Over flow
                                                                                 : 55...138
                                                             quantity cm3/10s: (40...153)
Low-idle speed regulation:
                                                            Delivery-quant. and breakaway char.: 1st speed 1/min: 700
                1/min: 350
Speed
Charge press. hPa: -
Del.quantity cm3/
1000H.: 13.0...17.0
hisnersion cm3/: 3.5
                                                            Charge-air pressure-setting
                                                           point hPa: 350
Del.quantity cm3/: 86,5...87,5
1000H.: (84,0...90,0)
               1000H.: (4,5)
                                                                           1/min: 1530
Full-load speed regulation:
                                                            2nd speed
                                                           Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...3,0
Speed
                1/min: 1400
Charge press. hPa: 1000
                                                           3rd speed 1/min: 1480
Charge press. hPa: 1000
Del.quantity cm3/: 7,5...16,5
1000H.: (7,0...17,0)
Deliquantity cm3/
                1000H: 52,0...58,0
Start:
                                                                           1/min: 1400
                                                            4th speed
                                                           Speed
                1/min: 100
Del.quantity mind.
          cm3/1000H.: 90.0
Inspection-pump test specifications
Test specifications in parentheses
                                                            Charge press. hPa: 1000
Timing-device characteristic:
                                                           Del.quantity cm3/: -
1000H.: (88,0...94,0)
7th speed 1/min: 700
                1/min: 950
1st speed
Charge press. hPa: 1000
                                                           Charge press. hPa: 1000
Del.quantity cm3/: 89,0...92
1000H: (86,8...94,2)
8th speed 1/min: 700
                   mm: 0.5...1.1
mm: (0.1...1.5)
TD travel
                1/min: 1100
2nd speed
Charge press. hPa: 1000
                                                            Charge press. hPa: -
TD travel
                   mm: -
                                                            Deliquantity cm3/: -
                   mm: (1,6...3,0)
                1/min: 1300
                                                                           1000H: (77,3...84,7)
3rd speed
                                                                           1/min: 500
Charge press. hPa: 1000
                                                            9th speed
                                                           Charge press. hPa: -
Del.quantity cm3/: 70,5...75,5
1000H: (69,3...76,7)
                   mm: 2,9...3,7
TD travel
                   mm: (2,6...4,0)
Supply-pump pressure characteristic:
                                                           Zero delivery (stop):
1st speed 1/min: 500
```

```
Mech. shutoff:
Speed
              1/min: 1300
Del.quantity cm3/: - i000H.
Electr. shutoff:
               1/min: 1300
Speed
ELAB
                volt: -
Del.quantity cm3/: - 1000H.
Idle delivery:
               1/min: 350
1st speed
Del.quantity cm3/: -
1000H.: (10,0..20,0)
2nd speed
               1/min: 400
Del.quantity cm3/: 4,0...10,0
1000H.: (2,0...12,0)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...2,5
Automatic starting fuel delivery:
1st speed
               1/min: 150
Deliquantity cm3/: -
               1000H: 100,0
 ind.
2nd speed
               1/min: 250
Del.quantity cm3/: -
               1000H: 70,0
Shutoff electromagnet:
Cut-in
min. voltage
                     : 10,0
                     : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                min
KF
                    : K-0T
                mm
                mm : 1.1.1,35
mm : 1.3
mm : 17.0...19.0
MS
SVS max.
XK
                mm: 10,5...13,9
XL
Remarks:
```

grand

1

Note inst. in remarks column

Test sheet : CUM 5,9 L2 Edition replaces : 10.12.86

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R173-5 Type number : 0 460 426 086

Customer-specific information : CUMMINS Customer

: 6BTA-5.9 IND. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar : 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm: 0,,3 (from BDC): +-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900 Charge press. hPa: 1000 Setting value mm: 1,9...2,3

Supply-pump pressure:

Speed 1/min: 900 Charge press. hPa: 1000

```
Setting value bar: 4,4...5,0
                                                          Charge press. hPa: 1000
                                                          Supply-pump
                                                                          bar: 2,7...3,3
1/min: 1150
Full-load del. with charge press.:
                                                           pressure
                                                          2nd speed
                                                                            hPa: 1000
Speed
                1/min: 750
                                                          Charge press.
Charge press. hPa: 1000
                                                          Supply-pump
Del.quantity cm3/

1000H.: 81.5...82,5

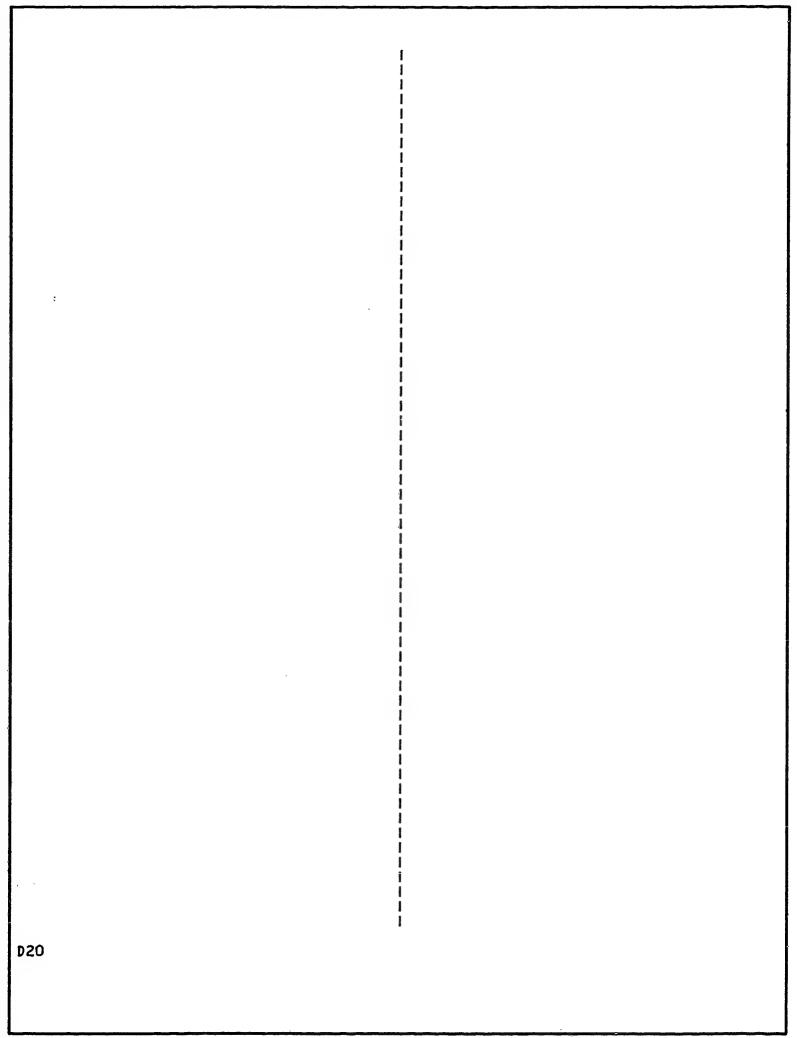
Dispersion cm3/: 4,0

1000H: (4,5)
                                                                            bar: 5,5...6,1
                                                           pressure
                                                          Overflow quantity at overflow valve:
                                                                          1/min: 500
                                                          1st speed
Full-load del. w/out charge press.:
                                                          Charge press. hPa: -
                                                          Oveflow |
                                                                                : 41...83
                                                           quantity cm3/10s: (267...98)
              1/min : 500
                                                          2nd speed 1/min: 1150
Del.quantity cm3/
              1000H.: 42,5...43,5
                                                          Charge press. hPa: 1000
                                                                            : 55...138
                                                          Overflow
                                                           quantity cm3/10s: (40...153)
Low-idle speed regulation:
               1/min: 375
Speed
                                                          Delivery-quant. and breakaway char.:
                                                          1st speed
                                                                         1/min: 700
Chargé press. hPa: -
Del.quantity cm3/
1000H.: 8,0...14,0
                                                          Charge-air pressure-setting
                                                           point
                                                                            hPa: 400
                                                          Del.quantity cm3/: 68.5...69.5
1000H.: (66.0...72.0)
2nd speed 1/min: 1280
Dispersion
                 cm3/: -
              1000H.: 5,5
Full-load speed regulation:
                                                          2nd speed
                                                          Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...3,0
Speed
                1/min: 1200
Charge press. hPa: 1000
Del.quantity cm3/
                                                          3rd speed
                                                                          1/min: 1260
                                                          Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...15,0
               1000H: 60,5...66,5
Start:
                                                          4th speed 1/min: 1240
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...15,0
               1/min: 100
Speed
Del.quantity mind.
         cm3/1000H.: 70,0
                                                                          1/min: 1200
                                                          5th speed
                                                          Charge press. hPa: 1000
Inspection-pump test specifications
                                                          Del.quantity cm3/: -
1000H.: (58,5....68,5)
Test specifications in parentheses
                                                                          1/min: 1150
                                                          6th speed
                                                          Charge press. hPa: 1000
Del.quantity cm3/: 76,0...79,0
1000H.: (74,5...80,5)
7th speed 1/min: 900
Timing-device characteristic:
               1/min: 750
1st speed
Charge press. hPa: 1000
                                                          Charge press. hPa: 1000
Del.quantity cm3/: 79.5...82.5
1000H.: (78.0...84.0)
8th speed 1/min: 750
TD travel
                   mm: 1,0...1,8
                   mm: (0,7...2,1)
               1/min: 900
2nd speed
Charge press. hPa: 1000
                                                          Charge press. hPa: 1000
TD travel
                   mm:
                                                          mm: (1,4...2,8)
3rd speed 1/min: 1150
Charge press. hPa: 1000
                                                                          1/min: 500
                                                          9th speed
                   mm: 2,5...3,3
mm: (2,2...3,6)
                                                          Charge press. hPa: 1000
TD travel
                                                          Del.quantity cm3/: 80,0...88,0
                                                                         1000H: (80,3...87,3)
                                                                          1/min: 500
                                                          10th speed
Supply-pump pressure characteristic:
                                                          Charge press. hPa: -
1st speed 1/min: 500
```

```
Del.quantity cm3/: -
               1000H: (40,0...46,0)
Zero delivery (stop):
Mech. shutoff:
Speed
               1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 375
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
               1/min: 350
1st speed
Del.quantity cm3/: 19.0..31.0
1000H.: (20.0..30.0)
2nd speed 1/min: 375
Del.quantity cm3/: -
1000H.: (6,0...16,0)
3rd speed 1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delivery:
1st speed
               1/min: 130
Del.quantity cm3/: -
               1000H: 70,0
 ind.
2nd speed
               1/min: 280
Del.quantity cm3/: -
               1000H: 70,0
Shutoff electromagnet:
Cut-in
 min. voltage
                     : 10,0
                     : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                mm
                     5,1...5,4
KF
                man
MS
                mm
SVS max.
                    : 2,4
                mm
ΧK
                     : 18,8...20,8
                mm
XL
                     : 11,6...15,0
                min
Correction at adjusting nut (46)
```

```
BOSCH-INJ.-PUMP TEST SPECIFICATIONS
                                                     Speed
                                                                  1/min: 750
                                                     Charge press. hPa: 1000
Setting value bar: 3,3...3,9
Note inst. in remarks column
                   : CUM 5,9 L3
Test sheet
                                                     Full-load del. with charge press.:
Edition
                   : 10.12.86
replaces
                                                                   1/min: 750
                                                     Speed
                                                     Charge press. hPa: 1000
                   : ISO 4113
Calibrating oil
                                                     Charge press. ...
Del.quantity cm3/
1000H.: 82,5...83,5
                   : VE 6/12F1050 R173-6
Injection pump
                    : 0 460 426 087
                                                                   cm3/:4.0
Type number
                                                     Dispersion
                                                                  1000H : (4,5)
Customer-specific information
Customer
                   : CUMMINS
                                                     Full-load del. w/out charge press.:
Engine
                   : 6BTA-5,9
                                                     Speed
                                                                  1/min : 500
                                                     Del.quantity cm3/
1000H.: 41.0...42,0
Dispersion cm3/: 9,0
Power
                  k: 125
               1/mi: 2100
Speed
                                                                  1000H.: -
TEST BENCH REQUIREMENTS
                                                     Low-idle speed regulation:
Calibrating-oil C
return temp.
                                                                   1/min: 375
                                                     Speed
with thermometer : 40...48 electronically : 42...50
                                                     Charge press. hPa: -
                                                     Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
Inlet press., bar : 0.2
                                                                  1000H.: -
Calibrating nozzle-holder
                                                     Full-load speed regulation:
 assembly
                   : 1 688 901 027
                                                                   1/min: 1100
Opening
                                                     Charge press. hPa: 1000
                                                     Del.quantity cm3/
               bar: 250...253
 pressure
                                                                   1000H: 59,0...65,0
Perforated-plate
              mm : 0.5
 diameter
                                                     Start:
                                                                   1/min: 100
                                                     Speed
                                                     Del.quantity mind.
Test inj. tubing : 1 680 750 017
                                                              cm3/1000H.: 60.0
Outside diameter
x Wall thickness : 2
                                                     Inspection-pump test specifications
                mm: 840
                                                     Test specifications in parentheses
x Length
Start of delivery
Prestroke
                mm:0.3
                                                     Timing-device characteristic:
         (from BDC): +-0.02(0.04)
                                                     1st speed
                                                                   1/min: 600
                                                     Charge press. hPa: 1000
Injection-pump setting values
                                                                   mm: 0,5...1,3
mm: (0,2...1,6)
1/min: 750
Test specifications in parentheses
                                                     TD travel
Timing-device travel:
                                                     2nd speed
                                                     Charge press. hPa: 1000
                                                                      mm: -
                                                     TD travel
             1/min: 750
Speed
Charge press. hPa: 1000
                                                                      mm: (0,9...2,3)
                                                     3rd speed 1/min: 1050
Setting value mm: 1,4...1,8
                                                     Charge press. hPa: 1000
Supply-pump pressure:
```

```
mm: 2,1...2,9
mm: (1,8...3,2)
TD travel
                                                            Charge press. hPa: 1000
                                                            Del.quantity cm3/: -
                                                                            1000H: (80,0...86,0)
                                                                            1/min: 500
Supply-pump pressure characteristic:
                                                            9th speed
                                                            Charge press. hPa: 1000
Del.quantity cm3/: 80.5...88.5
1090H: (80.8...88.2)
1st speed
                1/min: 200
Charge press. hPa: 1000
                                                                            1/min: 500
Supply-pump
                                                            10th speed
                                                            Charge press. hPa: -
                  bar: 0,8...1,4
 pressure
2nd speed
                1/min: 500
                                                            Del.quantity cm3/: -
Charge press. hPa: 1000
                                                                            1000H: (38.5...44.5)
Supply-pump
                bar: 2,3...2,9
1/min: 1050
 pressure
                                                            Zero delivery (stop):
3rd speed
Charge press. hPa: 1000
                                                            Mech. shutoff:
                                                                            1/min: -
Supply-pump
                                                            Speed
                                                            Del.quantity cm3/: - 1000H.
                  bar: 4,5...5,1
 pressure
Overflow quantity at overflow valve:
                                                            Electr. shutoff:
              1/min: 500
                                                                            1/min: 375
1st speed
                                                            Speed
                                                            Del.quantity cm3/: - 1000H.
Charge press. hPa: -
Oveflow
                      : 41...83
 quantity cm3/10s: (26...98)
2nd speed 1/min: 1050
                                                            Idle delivery:
Charge press. hPa: 1000
Over flow
                      : 55...138
                                                            1st speed
                                                                            1/min: 375
                                                            Del.quantity cm3/: -
1000H.: (6,0...16,0)
 quantity cm3/10s: (40...153)
                                                                            1/min: 500
Delivery-quant. and breakaway char.:
                                                            2nd speed
                                                            Del.quantity cm3/: -
1st speed
               1/min: 700
                                                                           1000H.: 0...4,0
Charge-air pressure-setting
                  hPa: 400
 point
Del.quantity cm3/: 70,5...71,5
1000H.: (68,0...74,0)
2nd speed 1/min: 1180
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...3,0
                                                            Automatic starting fuel delivery:
                                                                            1/min: 250
                                                            1st speed
                                                            Del.quantity cm3/: -
                                                                            1000H: 55,0
                                                             ind.
                1/min: 1150
                                                                            1/min: 350
3rd speed
                                                            2nd speed
Charge press. hPa: 1000
                                                            Del, quantity cm3/: -
Del.quantity cm3/: -
1000H.: 0...15,0
                                                                            1000H: 60,0
4th speed 1/min: 1120
Charge press. hPa: 1000
                                                            Shutoff electromagnet:
Del.quantity cm3/: -
1000H.: 0...15,0
                                                            Cut-in
                                                                                  : 10,0
                                                            min. woltage
                                                                                  : 12,0
                1/min: 1100
                                                            Rated voltage
5th speed
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: (57,0...67,0)
6th speed 1/min: 1050
                                                            Mounting and assembly dimensions:
                                                            Designation
Charge press. hPa: 1000
Del.quantity cm3/: 77,5...80,5
1000H.: (76,0...82,0)
                                                                             mm
                                                                                  : 5,1...5,4
: 1,3..1,55
                                                            KF
                                                                             mm
                                                            MS
                                                                             mm
                1/min: 900
                                                            SVS max.
                                                                                  : 2,0
7th speed
                                                                             mm
                                                                                  : 18,8...20,8
Charge press. hPa: 1000
                                                            ХK
                                                                             mm
Del.quantity cm3/: 78.0...81.0
1000H.: (76.5...82.5)
8th speed 1/min: 750
                                                            XL
                                                                             mm
                                                                                  : 12,2...15,6
                                                            Correction at adjusting nut (46)
8th speed
```



Note inst. in remarks column

Test sheet : PER 6.0 A1 Edition : 15.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R241-1 Type number : 0 460 426 088

Customer-specific information Customer : PERKINS

Engine : T6.60

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 020

Opening

pressure bar: 172...175

Perforated-plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840

Start of delivery
Prestroke mm: 0,3
(from BDC): +-0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1100 Charge press. hPa: 1000

```
Setting value bar: 7,2...7,8
                                                                   Charge press. hPa: 1000
                                                                   SuppTy-pump
                                                                                     bar: 4,7...5,3
1/min: 1300
Full-load del. with charge press.:
                                                                    pressure
                                                                   2nd speed
                  1/min: 1000
                                                                                       hPa: 1000
Speed
                                                                   Charge press.
Charge press. hPa: 1000
                                                                   Supply-pump
Del.quantity cm3/
1000H: 83.0...84.0
Dispersion cm3/: 3.5
1000H: (4.0)
                                                                    pressure
                                                                                       bar: 8,0...8,6
                                                                   Overflow quantity at overflow valve:
                                                                                     1/min: 500
                                                                   1st speed
                                                                   Charge press. hPa: 1000
Full-load del. w/out charge press.:
                                                                   Oveflow
                                                                                            : 41...138
                                                                     quantity cm3/10s: (26...153)
Speed
                1/min : 700
Del.quantity cm3/
                                                                                 1/min: 1300
                                                                   2nd speed
                                                                   Charge press. hPa: 1000
                1000H.: 76,0...77,0
                                                                                           : 55...138
                                                                   Overflow
                                                                     quantity cm3/10s: (40...153)
Low-idle speed regulation:
                                                                   Delivery-quant. and breakaway char.:
1st speed  1/min: 700
Speed
                  1/min: 350
Charge press. hPa: -
                  cm3/
Del.quantity
                                                                   Charge-air pressure-setting
                1000H.: 13.0...17.0 cm3/: 3.5
                                                                   point hPa: 250
Del.quantity cm3/: 80,5...81,5
1000H.: (78,0...84,0)
Dispersion
                1000H.: (4,5)
                                                                                     1/min: 1530
Full-load speed regulation:
                                                                   2nd speed
                                                                   Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1480
Charge press. hPa: 1000
Del.quantity cm3/: 12,0...20,0
1000H.: (11,0...21,0)
Speed
                  1/min: 1400
Charge press. hPa: 1000
Del.quantity cm3/
                  1000H: 52,0...58,0
Start:
                                                                                     1/min: 1400
                                                                   4th speed
                                                                  4th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: (50,0...60,0)
Sth speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm3/: 74,0...77,0
1000H.: (72,5...78,5)
Speed
                 1/min: 100
Del.quantity mind.
           cm3/1000H.: 88,0
Inspection-pump test specifications
Test specifications in parentheses
                                                                                     1/min: 1000
                                                                   6th speed
                                                                   Charge press. hPa: 1000
Timing-device characteristic:
                                                                  The speed 1/min: 700

Del.quantity cm3/: -

1000H.: (80,5...86,5)

7th speed 1/min: 700

Charge press. hPa: 1000

Del.quantity cm3/: 82,0...85,0

1000H.: (79,8...87,2)

8th speed 1/min: 700
1st speed
                  1/min: 950
                    hPa: 1000
mm: 0,5...1,1
Charge press.
TD travel
                      nm: (0,1,...,5)
2nd speed
                  1/min: 1100
Charge press. hPa: 1000
TD travel
                                                                   Charge press.
                                                                                       hPa: -
                     mm:
                                                                   Deliquantity cm3/:
                     mm: (1,6...3,0)
                 1/min: 1300
                                                                                     1000H: (72,8...80,2)
1/min: 500
3rd speed
3rd speed Charge press. hPa: 1000 mm: 2,9...3,7
                                                                   9th speed
                                                                   Charge press. hPa:
                     mm: (2,6...4,0)
                                                                   Del.quantity cm3/: 68,5...71,5
1000H: (66,3...73,7)
Supply-pump pressure characteristic:
                                                                   Zero delivery (stop):
1st speed 1/min: 500
```

```
Mech. shutoff:
Speed
               1/min: 1300
Del.quantity cm3/: - 1000H.
Idle delivery:
               1/min: 350
1st speed
Del.quantity cm3/: -
1000H.: (10,0..20,0)
                1/min: 400
2nd speed
Del.quantity cm3/: 4.0...10.0
1000H.: (2.0...12.0)
3rd speed 1/min: 450
Del.quantity cm3/: -
1000H.: 0...2,5
Automatic starting fuel delivery:
               1/min: 150
1st speed
Del.quantity cm3/: -
 ind.
                1000H: 100,0
               1/min: 250
2nd speed
Del.quantity cm3/: -
                1000H: 70,0
 ax.
Shutoff electromagnet:
Cut-in
                     : 10,0
 min. voltage
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
Designation
                 mm
KF
                     : K-0T
                 min
                    : 1,1..1,35
: 1,3
: 17,0...19,0
: 10,5...13,9
MS
                mm
SVS max.
                mm
XK
                mm
XL
                 mm
Remarks:
```

Correction at adjusting nut (46)

Full-load del. w/out charge press.: BOSCH-INJ.-PUMP TEST SPECIFICATIONS 1/min: 1000 Speed Note inst. in remarks column Del.quantity cm3/ 1000H.: 76.5...77,5 cm3/: 3,5 : PER 6,0 B Test sheet Dispersion : 15.12.86 1000H.: (4.5) Edition replaces : ISO 4113 Calibrating oil Low-idle speed regulation: : VE 6/12F1300 R247 Injection pump Speed 1/min: 300 Speed
Del.quantity cm3/
1000H.: 19.5...23.5
Dispersion cm3/: 3.5 Type number : 0 460 426 090 Customer-specific information 1000H.: (4,5) Customer : PERKINS Full-load speed regulation: : NA6.60 Engine 1/min: 1400 Speed TEST BENCH REQUIREMENTS Del.quantity cm3/ 1000H: 44,5...50,5 Calibrating-oil return temp. Start: with thermometer : 40...48 : 42...50 electronically Speed 1/min: 100 Deliquantity mind. Inlet press., bar : 0.2 cm3/1000H.: 80.0 Calibrating nozzle-holder Inspection-pump test specifications assembly : 1 688 901 020 Test specifications in parentheses Opening bar: 172...175 Timing-device characteristic: pressure Perforated-plate 1/min: 950 1st speed mm: 0,6...1,2 TD travel diameter mm : 0.6mm: (0,2...1,6)1/min: 1100 2nd speed TD travel Test inj. tubing : 1 680 750 901 mm: mm: (1,3...2,7)1/min: 1300 Outside diameter 3rd speed x Wall thickness : 2 mm: 2.8...3.6 mm: (2.5...3.9) TD travel mm: 840 x Length Start of delivery Supply-pump pressure characteristic: Prestroke mm: 0,5 1/min: 500 (from BDC): +-0.02(0.04)1st speed Supply-pump Injection-pump setting values Test specifications in parentheses bar: 2,7....3,3 pressure 1/min: 1300 2nd speed Supply-pump Timing-device travel: bar: 6,1...6,7 pressure Overflow quantity at overflow valve: 1/min: 1100 Speed Setting value mm: 1,8...2,2 1/min: 500 1st speed Oveflow : 41...83 Supply-pump pressure: cm3/10s: (26...98) 1/min: 1300 : 55...138 quantity 2nd speed 1/min: 1100 Speed Setting value bar: 5,2...5,8 Over #low

quantity cm3/10s: (40...153)

```
Delivery-quant. and breakaway char .:
1st speed
              1/min: 1530
Del.quantity cm3/: -
1000H:: 0...2,5
               1/min: 1480
3rd speed
Del.quantity cm3/: 11,3....20,5)
              1/min: 1400
4th speed
Del.quantity cm3/: -
1000H.: (42,5...52,5)
              1/min: 1300
5th speed
Del.quantity cm3/: 68,5...71,5
1000H.: (67,0...73,0)
               1/min: 1000
6th speed
Del.quantity cm3/: -
1000H.: (74,0...80,0)
              1/min: 700
7th speed
Del.quantity cm3/: /1,0....76,7)
              1/min: 500
8th speed
               cm3/: 65,0...68,0
Del.quantity
              1000H: (62,8...70,2)
Zero delivery (stop):
Mech. shutoff:
Speed
              1/min: 1300
Del.quantity cm3/: - 1000H.
Idle delivery:
              1/min: 300
1st speed
Del.quantity cm3/: -
1000H.: (16,5..26,5)
              1/min: 350
2nd speed
Del.quantity cm3/: 4,5...10,5
1000H.: (3,5...12,5)
              1/min: 400
3rd speed
Del.quantity cm3/: -
             1000H.: 0...2,5
Automatic starting fuel delivery:
1st speed
              1/min: 180
Del.quantity cm3/: -
               1000H: 90,0
 ind.
2nd speed
              1/min: 250
Del.quantity cm3/: -
              1000H: 60,0
 ax.
Shutoff electromagnet:
Cut-in
 min. voltage
                    : 10,0
                    : 12,0
Rated voltage
Mounting and assembly dimensions:
```

D25

Designation mm KF : K-0T mm MS mm : 1,2..1,45 SVS max. : 2,2 : 17,0...19,0 mm XK mm XL. mm : 10.6...14,0

Note inst. in remarks column

Test sheet : PER 6.0 B1 Edition : 15.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R247-2 Type number : 0 460 426 097

Customer-specific information Customer : PERKINS

Engine : NA6.60

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 020

Opening |

pressure bar : 172...175

Perforated-plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery Prestroke mm: 0,5

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1100

Setting value bar: 5,2...5,8

```
Full-load del. w/out charge press.:
                                                         Delivery-quant. and breakaway char.:
                                                                        1/min: 1530
Speed
              1/min : 1000
                                                         1st speed
                                                         Del.quantity cm5/: - 1000H.: 0...2,5
Del.quantity cm3/
              1000H.: 76.5...77.5 cm3/: 3.5
                                                                        1/min: 1480
                                                         3rd speed
Dispersion
                                                         Del.quantity cm3/: 11,5...19,5
              1000H.: (4,5)
                                                                       1000H.: (10,5...20,5)
                                                                        1/min: 1400
Low-idle speed regulation:
                                                         4th speed
                                                         Del.quantity cm3/: -
1000H.: (42,5...52,5)
5th speed 1/min: 1300
Del.quantity cm3/: 68,5...71,5
1000H.: (67,0...73,0)
               1/min: 300
Speed
Del.quantity cm3/
1000H.: 19.5...23,5
hisnersion cm3/: 3,5
              1000H.: (4.5)
                                                                        1/min: 1000
                                                         6th speed
                                                         Del.quantity cm3/: -
1000H.: (74,0...80,0)
Full-load speed regulation:
                                                                        1/min: 700
               1/min: 1400
                                                         7th speed
Speed
                                                         Del.quantity cm3/: 71,8...74,2
1000H.: (69,3...76,7)
                cm3/
Del.quantity
               1000H: 44,5...50,5
                                                                        1/min: 500
cm3/: 65,0...68,0
                                                         8th speed
Start:
                                                         Del.quantity
                                                                        1000H: (62,8...70,2)
Speed
               1/min: 100
Del.quantity mind.
                                                         Zero delivery (stop):
         cm3/1000H.: 80,0
                                                         Mech. shutoff:
                                                                        1/min: 1300
Inspection-pump test specifications
                                                         Speed
                                                         Del.quantity cm3/: - 1000H.
Test specifications in parentheses
Timing-device characteristic:
                                                         Idle delivery:
                                                                        1/min: 300
               1/min: 950
1st speed
                                                         1st speed
                                                         Del.quantity cm3/: -
1000H.: (16,5..26,5)
                   mm: 0,6...1,2
TD travel
                   mm: (0,2...1,6)
                                                                        1/min: 350
2nd speed
               1/min: 1100
                                                         2nd speed
                                                         Del.quantity cm3/: 4,5...10,5
1000H.: (3,5...12,5)
TD travel
                   mm:
                   mm: (1,3...2,7)
               1/min: 1300
                                                                        1/min: 400
3rd speed
                                                         3rd speed
                                                         Del.quantity cm3/: -
1000H.: 0...2,5
                  mm: 2,8...3,6
mm: (2,5...3,9)
TD travel
Supply-pump pressure characteristic:
                                                         Automatic starting fuel delivery:
               1/min: 500
                                                         1st speed
                                                                        1/min: 180
1st speed
Supply-pump
                                                         Del.quantity cm3/: -
                                                                        1000H: 90,0
                 bar: 2,7....3,3
                                                          ind.
 pressure
               1/min: 1300
2nd speed
                                                                        1/min: 250
Supply-pump
                                                         2nd speed
                                                                        cm3/:
                 bar: 6,1...6,7
                                                         Del.quantity
 pressure
                                                                        1000H: 60,0
                                                          ax.
Overflow quantity at overflow valve:
                                                         Shutoff electromagnet:
               1/min: 500
1st speed
Oveflow.
                                                         Cut-in
                     : 41...83
             cm3/10s: (26...98)
                                                          min. voltage
 quantity
               1/min: 1300
                                                         Rated voltage
2nd speed
Over flow
                     : 55...138
            cm3/10s: (40...153)
                                                         Mounting and assembly dimensions:
 quantity
D27
```

Designation K KF MS SVS max. XK XL mm : -mm : K-0T mm : 1,2..1,45 mm : 2,2 mm : 17,0...19,0 mm : 10.6...14,0

Note inst. in remarks column

Test sheet : STE 6,5K2 Edition replaces : 16.12.86

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R265 Type number : 0 460 426 099

Type number : 0 460 426 099

Customer-specific information Customer : STEYR

: WD 612.61 Engine

Power k: 100

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 800 Speed Setting value mm: 2,3...2,7

Supply-pump pressure:

1/min: 800 Speed

Setting value bar: 5,9...6,5

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del.quantity cm3/ 1000H.: 83,0...84,0

Dispersion cm3/: 3,5 1000H.: (4,5)	3rd speed 1/min: 1300 Del.quantity cm3/: - 1000H.: (13,023,0)
Low-idle speed regulation:	4th speed 1/min: 1200
Speed 1/min: 300	Del.quantity cm3/: 80,583,5 1000H.: (79,085,0) 5th speed 1/min: 1000 Del.quantity cm3/: - 1000H.: (80,586,5)
Dispersion cm3/: 3.5 1000H.: (4.5) Full-load speed regulation:	6th speed 1/min: 800 . Del.quantity cm3/: 80,282,8 1000H.: (78,385,2)
Speed 1/min: 1300 Del.quantity cm3/ 1000 15,021,0	7th speed 1/min: 500 Del.quantity cm3/: 76,579,5 1000H.: (74,381,7)
Start:	Zero delivery (stop):
Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 90,0	Mech. shutoff: Speed 1/min: 1200 Del.quantity cm3/: - 1000H.
Inspection-pump test specifications Test specifications in parentheses	Idle delivery:
Timing-device characteristic:	1st speed 1/min: 300 Del.quantity cm3/: - 1000H.: (13,023,0)
1st speed 1/min: 600 TD travel mm: 0.81.4 mm: (0.41.8)	2nd speed 1/min: 350 Del.quantity cm3/: 1,07,0 1000H.: -
2nd speed	3rd speed 1/min: 400 Del.quantity cm3/: - 1000H.: 02,5
3rd speed 1/min: 1200 TD travel mm: 2,83,6 mm: (2,53,9)	Automatic starting fue! delivery:
Supply-pump pressure characteristic:	1st speed 1/min: 170 Del.quantity cm3/: - ind. 1000H: 90,0
1st speed 1/min: 600 Supply-pump pressure bar: 5.05,6 2nd speed 1/min: 1200	2nd speed 1/min: 250 Del.quantity cm3/: - ax. 1900H: 65,0
Supply-pump pressure bar: 7,68,2	Shutoff electromagnet:
Overflow quantity at overflow valve:	Cut-in
1st speed	min. voltage : - Rated voltage : -
quantity cm3/10s: (2698) 2nd speed 1/min: 1200	Mounting and assembly dimensions:
Overflow : 55138 quantity cm3/10s: (40153)	Designation K mm : 3,23,4 KF mm : 5,76,0
Delivery-quant. and breakaway char.: 1st speed	KF mm : 5,76,0 MS mm : 1,31,55 SVS max. mm : 5,2
1000H.: 02,5	Remarks:

Note inst. in remarks column

Test sheet : CUM 5.9 L4 Edition : 11.12.86 replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R173-8 Type number : 0 460 426 101

Customer-specific information Customer : CUMMINS

Engine : 6BTA-5,9

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening |

bar : 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750 Charge press. hPa: 1000 Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 750 Charge press. hPa: 1000

```
Setting value bar: 3,2...3,8
                                                               Charge press. hPa: 1000
                                                               Supply-pump
Full-load del. with charge press.:
                                                                                bar: 2,1...2,7
1/min: 1050
                                                                 pressure
                                                               2nd speed
                                                                                  hPa: 1000
Speed
                 1/min: 750
                                                               Charge press.
Charge press. hPa: 1000
                                                               Supply-pump
Del.quantity cm3/
1000H.: 84,0...87,5
                                                                pressure
                                                                                  bar: 4.3...4.9
                cm3/: 4.0
1000H: (4,5)
                                                               Overflow quantity at overflow valve:
Dispersion
                                                               1st speed
                                                                                1/min: 500
                                                               Charge press. hPa:
Oveflow:
Full-load del. w/out charge press.:
                                                                                         41...83
                1/min : 500
                                                                 quantity cm3/10s: (26...98)
Del.quantity cm3/
                                                               2nd speed
                                                                               1/min: 1250
                1000H.: 41....42,0
                                                               Charge press. hPa: 1000
                                                               Overflow
                                                                                      : 55...138
                                                                 quantity cm3/10s: (40...153)
Low-idle speed regulation:
                                                               Delivery-quant. and breakaway char.: 1st speed 1/min: 700
Speed
                 1/min: 375
Charge press. hPa: -
Del.quantity
                 cm3/
                                                               Charge-air pressure-setting
               1000H.: 8,0...14,0
                                                                 point
                                                                                  hPa: 450
                                                               Del.quantity cm3/: 68.0...69.0
1000H.: (65.5...71.5)
                  cm3/: 5,5
Dispersion
                1000H.: -
                                                                                1/min: 1400
                                                               2nd speed
Full-load speed regulation:
                                                               Charge press. hPa: 1000
                                                               Del.quantity cm3/: -
1000H.: 0...3,0
3rd speed 1/min: 1370
Charge press. hPa: 1000
Speed
                 1/min: 1300
Charge press. hPa: 1000
Deliquantity cm3/
                 1000H: 61,0...67,0
                                                               Del.quantity cm3/: -
1000H.: 0...15,0
Start:
                                                                                1/min: 1330
                                                               4th speed
                                                               Charge press. hPa: 1000
Del.quantity cm3/: -
1000H.: 0...15,0
Speed
                 1/min: 100
Del.quantity mind.
          cm3/1000H.: 70,0
                                                               5th speed 1/min: 1300
Charge press. hPa: 1000
Inspection-pump test specifications
                                                               Del.quantity cm3/: -
1000H.: (59,0...69,0)
6th speed 1/min: 1250
Test specifications in parentheses
                                                               Charge press. hPa: 1000
Timing-device characteristic:
                                                               The speed 1/min: 1000

Del.quantity cm3/: 75,0...78,0

1000H.: (73,5...79,5)

7th speed 1/min: 1050

Charge press. h%: 1000

Del.quantity cm3/: 80,5...83,5

1000H.: (79,0...85,0)

8th speed 1/min: 750

Charge press. hR: 1000
                 1/min: 600
1st speed
Charge press. hPa: 1000
                    mm: 0,4...1,2
mm: (0,1...1,5)
TD travel
2nd speed
                 1/min: 750
Charge press. hPa: 1000
                                                                                 hPa: 1000
TD travel
                                                               Charge press.
                    mm: -
                mm: (0,9...2,3)
1/min: 1050
                                                               Del.quantity cm3/: -
                                                                                1000H: (81,5...87,5)
3rd speed
                                                                                1/min: 500
Charge press. hPa: 1000
                                                               9th speed
                                                               Charge press. hPa: 1000
Del.quantity cm3/: 84.5...92.5
1000H: (84.8...92.2)
                    mm: 2,3...3,1
mm: (2,0...3,4)
TD travel
                                                                                1/min: 500
Supply-pump pressure characteristic:
                                                               10th speed
                                                               Charge press. hPa: -
1st speed
                1/min: 500
```

E05

```
Del.quantity cm3/: -
              1000H: (38,5...44,5)
Zero delivery (stop):
Mech. shutoff:
Speed
              1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
Speed
              1/min: 375
Del.quantity cm3/: - 1000H.
Idle delivery:
             1/min: 375
1st speed
Del.quantity cm3/: -
1000H.: (6,0...16,0)
2nd speed
              1/min: 500
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delivery:
             1/min: 200
1st speed
Del.quantity cm3/: -
              1000H: 60,0
 ind.
2nd speed
              1/min: 350
Del.quantity cm3/: -
              1000H: 60,0
Shutoff electromagnet:
Cut-in
min. voltage
Rated voltage
Mounting and assembly dimensions:
Designation
               mm
                   : 5,1...5,4
KF
               mm
                   : 1,3..1,55
: 2,2
: 18,8...20,8
MS
               mm
SVS max.
               mm
ΧK
               mm
XL
                   : 12,9...16,3
               mm
Correction at adjusting nut (46)
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : PEU 1.7 A Edition : 16.12.86 replaces : 9.85 : ISO 4113 Calibrating oil : VE 4/8F2300 R171 Injection pump Type number : 0 460 484 010 Customer-specific information Customer : PEUGEOT Engine : XUD 7 TEST BENCH REQUIREMENTS Calibrating-oil return temp. with thermometer : 40...48 : 42...50 electronically Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 022 assembly Opening bar : 130...133 pressure Test inj. tubing : 1 680 750 073 Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1250 Setting value mm: 3,4...3,8 Supply-pump pressure: 1/min: 1250 Speed Setting value bar: 4,3...4,9 Full-load del. w/out charge press.: 1/min : 1250 Speed Del.quantity cm3/ 1000H.: 28.0...29.0 cm3/: 2,5 Dispersion

1000H.: -

Low-idle speed regulation: 1/min: 375 Speed Del.quantity cm3/ 1000H.: 8,0...12,0 cm3/: 2.0 1000H.: (3,0) Dispersion Residual-Delivery Setting Speed 1/min: 550 Del.quantity cm3/ 1000H.: 3,5...4,5 Full-load speed regulation: Speed 1/min: 2400 Del.quantity cm3/ 1000H: 19,0...25,0 Start: Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 42,0 Load-dependent start of delivery: Speed 1/min: 1250 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 800 1st speed TD travel mm: 0,8...1,6 mm: (0.5...1,9) 1/min: 1250 2nd speed TD travel mm: mm: (2,9...4,3) 1/min: 2000 3rd speed mm: 7,5...8,3 mm: (7,2...8,6) TD travel Supply-pump pressure characteristic: 1/min: 800 1st speed Supply-pump bar: 3,0...3,6 pressure 1/min: 1250 2nd speed Supply-pump bar: 4,3...4,9 pressure 3rd speed 1/min: 2000 Supply-pump bar: 6,4...7,0 pressure Overflow quantity at overflow valve: 1st speed 1/min: 800

Oveflow : 41...83 cm3/10s: (26...98) 1/min: 2300 quantity 2nd speed : 55..138 Over flow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2650 Del.quantity cm3/: -1000H.: 0...7,0 1/min: 2500 3rd speed Del.quantity cm3/: 11.5...17.5 1000H.: (10.5...18.5) 1/min: 2400 4th speed Del.quantity cm3/: 1000H.: (18,0...26,0) Sth speed 1/min: 2250
Del.quantity cm3/: 27.0...29.0
1000H.: (25.8...30.2) 1/min: 2000 6th speed cm3/: 27,5...29,5 Del.quantity 1000H.: (26,3...30,7) 1/min: 1250 7th speed cm3/: -Del.quantity 1000H.: (26,3...30,7) 1/min: 800 8th speed cm3/: 28,0...30,0 Del.quantity 1000H: (26,8...31,2) 1/min: 500 9th speed Del.quantity cm3/: 28,0...31,0 1000H: (26,5...32,5) Zero delivery (stop): Mech. shutoff: Speed 1/min: 2300 Del.quantity cm3/: - 1000H. Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: -1000H.: (6,0...14,0) High Idle: 1/min: 450 Speed Del.quantity cm3/: 8,0...12,0 1000H.: (6,0...14,0) Residual: 1/min: 550 Speed Del.quantity : -1000H.: 0....8,0 Automatic starting fuel delivery: 1/min: 200 1st speed Del.quantity cm3/: ind. 1000H: 44,0

2nd speed 1/min: 300 Del.quantity cm3/: ax. 1000H: 34,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

KF mm : 3,2...3,4
KF mm : 5,2...5,5
MS mm : 1,3...1,5
SVS max. mm : 3,0
XK mm : 18,9...20,9
XL mm : 12,2...15,6

Setting of residual delivery.

Idle setting (LFG) according to VDT-I-460/135.

```
BOSCH-INJ.-PUMP TEST SPECIFICATIONS
                                                    Speed
                                                                  1/min: 400
                                                    Del.quantity cm3/
1000H.: 14,5...16,5
Note inst. in remarks column
                                                                 cm3/: 2.0
1000H.: (3,0)
                                                    Dispersion
                   : VWW 1,3 A
Test sheet
                   : 02.04.87
Edition
                                                    Residual-Delivery Setting
replaces
                   : 4.86
                                                    Speed
                                                                  1/min: 575
                   : ISO 4113
Calibrating oil
                                                    Del.quantity cm3/
                                                                 1000H.: 2,5...3,5
                   : VE 4/8F2450 L212
Injection pump
                                                    Full-load speed regulation:
                   : 0 460 484 011
Type number
                                                    Speed
                                                                  1/min: 2600
Customer-specific information
                                                    Del.quantity cm3/
Customer
                                                                  1000H: 8,0...14,0
TEST BENCH REQUIREMENTS
                                                    Start:
Calibrating-oil
                                                                  1/min: 100
                                                    Speed
                                                    Deliquantity mind.
 return temp.
with thermometer : 40...48
                                                            cm3/1000H.: 32.0
                   : 42...50
electronically
                                                    Inspection-pump test specifications
                                                    Test specifications in parentheses
Inlet press., bar : 0.2
Calibrating nozzle-holder
 assembly
                   : 1 688 901 000
                                                    Timing-device characteristic:
Opening
                                                    1st speed
                                                                  1/min: 1000
                                                                     mm: 2,0...2,8
mm: (1,7...3,1)
               bar: 147...150
                                                    TD travel
 pressure
                                                                  1/min: 1500
                                                    2nd speed
Test inj. tubing : 1 680 750 017
                                                    TD travel
                                                                     mm:
                                                                     mm: (4,0...5,4)
                  : 6
                                                                  1/min: 2000
Outside diameter
                                                    3rd speed
                                                    TD travel
                                                                     mm: 6,9...7,7
x Wall thickness
                                                                  mm: (7,6...8,0)
1/min: 2450
                mm: 840
x Length
                                                    4th speed
                                                    TD travel
                                                                     mm: 8,6...9,4
Injection-pump setting values
Test specifications in parentheses
                                                                     mm: (8,3...9,7)
                                                    Supply-pump pressure characteristic:
Timing-device travel:
              1/min: 1500
                                                    1st speed
                                                                  1/min: 600
Speed
Setting value mm: 4,5...4,9
                                                    Supply-pump
                                                                    bar: 3,1...4,1
                                                    pressure
                                                                  1/min: 2450
Supply-pump pressure:
                                                    2nd speed
                                                    Supply-pump
                                                                    bar: 7,7...8,5
              1/min: 1500
Speed
                                                     pressure
Setting value bar: 5,4...6,0
                                                    Overflow quantity at overflow valve:
Full-load del. w/out charge press.:
                                                    1st speed
                                                                  1/min: 600
                                                                       : 55...70
                                                    Oveflow
             1/min : 1500
Speed
Del.quantity cm3/
1000H.: 23,5...24,5
Dispersion cm3/: 2,0
                                                                cm3/10s: (50...75)
1/min: 2450
                                                     quantity
                                                    2nd speed
                                                    Over flow
                                                                       : 82...112
             1000H.: (3,0)
                                                     quantity cm3/10s: (77...117)
                                                    Delivery-quant. and breakaway char.:
Low-idle speed regulation:
E09
```

```
1st speed
                1/min: 2800
Del.quantity cm3/: -
                1000H.: 0...6,0
                 1/min: 2550
3rd speed
Del.quantity cm3/: 10,5...20,5
1000H.: (9,5...21,5)
                 1/min: 2600
4th speed
Del.quantity cm3/: -
1000H.: (7.0...15.0)

5th speed 1/min: 2450

Del.quantity cm3/: 19.0...21.0
1000H.: (17.8...22.2)

6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (21,8...26,2)
                1/min: 600
7th speed
Del.quantity cm3/: 15.0...18.0
1000H.: (13.5...19.5)
Zero delivery (stop):
Mech. shutoff:
Speed
                 1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
Speed
                 1/min: 450
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
                 1/min: 400
Del.quantity cm3/: -
1000H.: (11,5..19,5)
                1/min: 450
2nd speed
Del.quantity cm3/: 5.5...8.5
1000H.: (3,0...11,0)
Residual:
Speed 1/min: 525
Del.quantity: 2,3...4,3
1000H.: (0,8...5,8)
Automatic starting fuel delivery:
                 1/min: 250
1st speed
Del.quantity cm3/: -
                 1000H: 25,0
 ind.
2nd speed
                 1/min: 400
Del.quantity cm3/: -
                 1000H: 28,0
 ax.
Shutoff electromagnet:
Cut-in
                        : 10,0
 min. voltage
                        : 12,0
```

Rated voltage

E10

Mounting and assembly dimensions:

Designation

: 3,2...3,4 mm KF mm : 1,3...1,5 MS mm SVS max. mm

Remarks:

Setting of residual delivery.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column Speed 1/min: 350 Del.quantity cm3/ 1000H.: 9,0...13,0 Test sheet : FIA 1,3H5 cm3/: 2,5 Edition : 18.12.86 Dispersion 1000H.: replaces Calibrating oil : ISO 4113 Full-load speed regulation: : VE 4/8F2000 R61-1 Injection pump Speed 1/min: 2100 : 0 460 484 012 Type number Del.quantity cm3/ 1000H: 11.5...18.5 Customer-specific information : FIAT PANDA Customer Start: : x8/29 Engine Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 28,0 TEST BENCH REQUIREMENTS Calibrating-oil CC Load-dependent start of delivery: return temp. with thermometer : 40...48 Speed 1/mir: 1600 : 42...50 electronically Inspection-pump test specifications Test specifications in parentheses Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 000 Timing-device characteristic: assembly 1/min: 600 Opening 1st speed mm: 0,5...1,3 pressure bar: 147...150 TD travel mm: (0,2...1,6)1/min: 1600 2nd speed Test inj. tubing : 1 680 750 017 TD travel mm: mm: (4,3...5,7) 1/min: 2000 3rd speed Outside diameter : 6 mm: 6,2...7,0 mm: (5,9...7,3) x Wall thickness : 2 TD travel mm: 840 x Length Injection-pump setting values Supply-pump pressure characteristic: Test specifications in parentheses 1/min: 600 1st speed Supply-pump Timing-device travel: bar: 3,3...3,9 pressure 1/min: 2000 1/min: 1600 2nd speed Setting value mm: 4,8...5,2 Supply-pump bar: 7,7...8,3 pressure Supply-pump pressure: Overflow quantity at overflow valve: 1/min: 1600 Speed 1/min: 500 Setting value bar: 6,4...70 1st speed Oveflow : 41...83 cm3/10s: (26...98) 1/min: 2000 Full-load del. w/out charge press.: quantity 2nd speed Overflow : 55...138 1/min : 1200 Speed Del.quantity cm3/ quantity cm3/10s: (40...153) 1000H.: 22,5...23,5 cm3/: 2,5 Dispersion Delivery-quant. and breakaway char.: 1000H.: -1st speed 1/min: 2300 E11

```
Del.quantity cm5/: -
1000H.: 0...2,0
3rd speed 1/min: 2150
Del.quantity cm3/: 5.0...11.0
1000H.: (4.0...12.0)
4th speed 1/min: 2100
Del.quantity cm3/:
Del.quantity cm3/: -
               1000H.: (11,0...19,0)
                1/min: 2000
5th speed
               cm3/: 18,2...20,8
1000H.: (17,3...21,7)
1/min: 1600
Del.quantity
6th speed
Del.quantity cm3/: 19.3...21.8
1000H.: (18.3...22,7)
7th speed 1/min: 1200
Del.quantity cm3/: -
               1000H.: (20,8...25,2)
                1/min: 600
8th speed
Del.quantity cm3/: 18,5...21,5
1000H: (17,0...23,0)
Zero delivery (stop):
Mech. shutoff:
Speed
                1/min: -
Del.quantity cm3/: -
               1000H.
Electr. shutoff:
                1/min: 2000
Speed
ELAB
                 volt: -
Del.quantity cm3/: -
               1000H.
Idle delivery:
1st speed
                1/min: 350
Del.quantity cm3/: -
1000H.: (7,0...15,0)
                1/min: 450
2nd speed
Del.quantity cm3/: -
1000H.: 0...4,0
3rd speed
                1/min: 550
                cm3/: -
Del.quantity
               1000H.: 0...2,0
Automatic starting fuel delivery:
1st speed
                1/min: 350
Del.quantity cm3/: -
                1000H: 26,0
 ind.
2nd speed
                1/min: 450
Del.quantity cm3/: -
                1000H: 26.0
Shutoff electromagnet:
Cut-in
                      : 10,0
 min. voltage
```

E12

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

KF mm : 3,2...3,4
KF mm : 6,1...6,2
MS mm : 1,4..1,65
SVS max. mm : -

Note inst. in remarks column

Test sheet : PEU 2,0 D
Edition : 10.12.86
replaces : 10.84
Calibrating eil : ISO-4113

Injection pump : VE 4/9F2200 R69 Type number : 0 460 494 055

Customer-specific information Customer : RENAULT

Engine : J 8 S-702

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. OC

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400 Charge press. hPa: 800 Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400 Charge press. hPa: 800 Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/ 1000H.: 48,6...49,6 Dispersion cm3/: 2,5 Supply-pump bar: 1,9...2,5 1/min: 1800 pressure 2nd speed 1000H : (3,0)hPa: 800 Charge press. Supply-pump Full-load del. w/out charge press.: pressure bar: 6,3...6,9 1/min : 600 Overflow quantity at overflow valve: Speed Del.quantity cm3/ 1000H.: 37,6...38,6 1/min: 600 1st speed Charge press. hPa: -Low-idle speed regulation: Oveflow quantity cm3/10s: (26...98) 2nd speed 1/min: 2200 1/min: 350 Charge press. hPa: -Charge press. hPa: 800 cm3/ Over flow : 55...138 Del.quantity 1000H.: 9,0...13,0 cm3/: 2,5 1000H.: (3,0) quantity cm3/10s: (40...153) Dispersion Delivery-quant. and breakaway char.: 1st speed 1/min: 700 Full-load speed regulation: Charge-air pressure-setting 1/min: 2400 hPa: 200 point Speed mm: 4,5 Charge press. hPa: 800 LDA stroke Del.quantity cm3/: 42.1...43.1 1000H.: (39.6...44.8) Deliquantity cm3/ 1000H: 23,0...29,0 1/min: 2700 2nd speed Charge press. hPa: 800
Del.quantity cm3/: 1000H.: 0...2,0 Start: Speed 1/min: 100 1/min: 2500 Del.quantity mind. 3rd speed Charge press. hPa: 800
Del.quantity cm3/: 1000H.: 0...17,5 cm3/1000H.: 60,0 Inspection-pump test specifications Test specifications in parentheses 4th speed 1/min: 2400 Charge press. hPa: 800
Del.quantity cm3/: 1000H.: (22,0...30,0)
Sth speed 1/min: 2000 Timing-device characteristic: Charge press. hPa: 800 Del.quantity cm3/: 45.1...47.1 1000H.: (43.9...48.3) 1/min: 1000 1st speed Charge press. hPa: 800 mm: 1,9...2,7 TD travel 1/min: 1400 mm: (1,6...3,0)6th speed Charge press. hPa: 800
Del.quantity cm3/: 1000H.: (46,9...51,3)
7th speed 1/min: 1000 2nd speed 1/min: 1400 Charge press. hPa: 800 TD travel mm: mm: (3,5...4,9)Charge press. hPa: 800
Del.quantity cm3/: 45,6...48,6
1000H.: (44,1...50,1) 1/min: 1800 3rd speed Charge press. hPa: 800 mm: 5,7...6,5 TD travel 1/min: 600 mm: (5,4...6,8)9th speed 1/min: 2000 4th speed Charge press. hPa: -Del.quantity cm3/: -Charge press. hPa: 800 1000H: (35,9...40,3) mm: 6,2...7,0 mm: (5,9...7,3) TD travel Zero delivery (stop): Supply-pump pressure characteristic: Mech. shutoff: 1/min: -1st speed 1/min: 400 Speed Del.quantity cm3/: - 1000H. Charge press. hPa: 800

```
Electr. shutoff:
                1/min: 2200
Speed
ELAB
                 volt: -
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
                1/min: 480
Del.quantity cm3/: -
1000H.: 0...2,0
2nd speed 1/min: 375
Del.quantity cm3/: 4.0...8.0
1000H.: (2.0...10.0)
3rd speed 1/min: 350
Del.quantity cm3/: -
1000H.: (7,0...15,0)
Automatic starting fuel delivery:
               1/min: 180
1st speed
Del.quantity cm3/: -
                1000H: 40,0
 ind.
                1/min: 300
2nd speed
Del.quantity cm3/: -
                1000H: 40,0
 ax.
Shutoff electromagnet:
Cut-in
 min. voltage
                      : 10,0
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
Designation
                     : 3,2-3,4
: 5,7-5,9
K
                 mm
KF
                 mm
MS
                 min
SVS max.
                 mes
                     20,2-22,2
9,1-12,4
XK
                 mm
XL
                 mm
Correction at adjusting nut (46)
 emarks:
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column 1/min: 400 Speed Del.quantity cm3/ 1000H.: 6,0...10,0 Dispersion cm3/: 2,5 1000H.: (3,0) : PEU 2,5 A Test sheet Edition : 10.12.86 : 3.85 replaces Calibrating oil : ISO-4113 Full-load speed regulation: : VE 4/9F2250 R84 Injection pump 1/min: 2325 Speed Del.quantity cm3/ : 0 460 494 079 Type number 1000H: 25,5...31,5 Customer-specific information Customer : PEUGEOT Start: Engine : XD3 505 D Speed 1/min: 100 Del.quantity mind. TEST BENCH REQUIREMENTS cm3/1000H.: 45.0 Calibrating-oil C Load-dependent start of delivery: return temp. with thermometer : 40...48 Speed 1/min: 1250 : 42...50 electronically Inspection-pump test specifications Inlet press., bar : 0.2 Test specifications in parentheses Calibrating nozzle-holder assembly : 1 688 901 022 Timing-device characteristic: 1/min: 700 Opening 1st speed mm: 0,6...1,4 mm: (0,3...1,7) pressure bar : 130...133 TD travel 1/min: 1250 2nd speed Test inj. tubing : 1 680 750 073 TD travel mm : mm: (3,5...4,9) 1/min: 2000 Outside diameter 3rd speed mm: 8,1...8,9 mm: (7,8...9,2) x Wall thickness TD traved mm: 450 x Length Injection-pump setting values Supply-pump pressure characteristic: Test specifications in parentheses 1/min: 400 1st speed Supply-pump Timing-device travel: bar: 2.1...2,7 1/min: 2200 pressure 1/min: 1250 2nd speed Setting value mm: 4,0...4,4 Supply-pump bar: 7,5...8,1 pressure Supply-pump pressure: Overflow quantity at overflow valve: 1/min: 1250 Speed 1/min: 400 Setting value bar: 5,0...5,6 1st speed veflow : 41...83 quantity cm3/10s: (26...98) and speed 1/min: 2250 Oveflow Full-load del. w/out charge press.: 2nd speed Over flow : 55...138 1/min: 1250 Speed Del.quantity cm3/ 1000H.: 38,5...39,5 Dispersion cm3/: 2,5 1000H.: (3,0) quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2550 E16

```
Del.quantity cm3/: -
1000H.: 0...2,0
               1/min: 2450
2nd speed
               cm3/: 4,5...12,5
Del.quantity
              1000H.: (4.5...12,5
1/min: 2325
3rd speed
Del.quantity cm3/: -
1000H.: (24,5...32,5)
4th speed 1/min: 2200
Del.quantity cm3/: 39.0..41.0
1000H.: (37.8..42.2)
               1/min: 2000
5th speed
Del.quantity cm3/: 38,5...40,5
1000H.: (37,3...41,7)
               1/min: 1250
6th speed
Del.quantity cm5/: -
1000H.: (36,8...41,2)
               1/min: 600
7th speed
Del.quantity cm3/: 35,5...38,5
1000H.: (34,0...40,0)
Zero delivery (stop):
Mech. shutoff:
               1/min: -
Speed
Del.quantity cm3/: - 1000H.
Electr. shutoff:
Speed
               1/min: 2250
ELAB
                volt: -
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 400
Del.quantity cm3/: -
1000H.: (4,0...12,0)
2nd speed
               1/min: 440
Del.quantity cm3/: -
1000H.: 0...2,0
Automatic starting fuel delivery:
               1/min: 350
1st speed
Del.quantity cm3/: -
 ind.
               1000H: 45,0
2nd speed
               1/min: 450
Del.quantity
                cm3/: -
               1000H: 45,0
 ax.
Shutoff electromagnet:
Cut-in
                      : 10,0
min. voltage
Rated voltage
                      : 12,0
Mounting and assembly dimensions:
```

E17

Note inst. in remarks column

Test sheet : REN 2.0 E
Edition : 02.04.87
replaces : 7.84
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2400 R95 Type number : 0 460 494 105

Customer-specific information Customer : RENAULT

Engine : F8M

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400 Setting value mm: 4,1...4,5 KSB solenoid-operated

valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1400
Setting value bar: 4,9...5,5
KSB solenoid-operated
valve volt: 12,0

Full-load del. W/out charge press.:

Speed 1/min : 1000

```
Del.quantity cm3/
1000H.: 28,5...29,5
                                                                         mm: 6,3...7<sub>4</sub>1
                                                       TD travel
                                                                         mm: (6,0...7,4)
KSB solenoid-operated
                                                       KSB solenoid-operated
                volt: 12.0 cm3/: 2,5
                                                                      volt: 12,0
1/min: 2100
                                                        valve
Dispersion
                                                       5th speed
             1000H .: -
                                                                         mm: 6,7...7,5
mm: (6,4...7,8)
                                                       TD travel
Low-idle speed regulation:
                                                       KSB solenoid-operated
                                                                      volt: 12,0
1/min: 2400
mm: 7,0...7,7
                                                        valve
               1/min: 425
Speed
                                                       6th speed
Del.quantity cm3/
1000H.: 6,0...10,0
                                                       TD travel
                                                                         mm: (6,6...8,0)
                                                       KSB solenoid-operated
KSB solenoid-operated
                                                                       volt: 12.0
                volt: 12,0
                                                        valve
                cm3/: 2,0
Dispersion
              1000H.:
                                                       Mfg. date: from
                                                       1st speed
                                                                      1/min: 300
Full-load speed regulation:
                                                                         mm: 2,0...4,0
                                                       TD travel
Speed
               1/min: 2550
                                                                         mm: -
Del.quantity
               cm3/
               1000H: 21,0...29,0
                                                       Supply-pump pressure characteristic:
KSB solenoid-operated
                volt: 12,0
 valve
                                                       1st speed
                                                                      1/min: 600
                                                       Supply-pump
                                                        pressure
Start:
                                                                        bar: 2,5...3,1
                                                       KSB solenoid-operated
                                                                      volt: 12.0
1/min: 2400
Speed
                                                        valve
               1/min: 100
Del.quantity mind.
cm3/1000H.: 42,0
                                                       2nd speed
                                                       Supply-pump
KSB solenoid-operated
                                                        pressure
                                                                        bar: 7,7...8,3
 valve
                                                       KSB solenoid-operated
                volt: 12,0
                                                        valve
                                                                       volt: 12,0
Load-dependent start of delivery:
                                                       Overflow quantity at overflow valve:
               1/min: 1400
KSB solenoid-operated
                                                                      1/min: 600
                                                       1st speed
 valve
                volt: 12,0
                                                       KSB solenoid-operated
                                                        valve
                                                                       volt: 12,0
                                                                            : 55...70
Inspection-pump test specifications
                                                       Oveflow
                                                        quantity cm3/10s: (50...75)
Test specifications in parentheses
                                                                      1/min: 2400
                                                       2nd speed
                                                       KSB solenoid-operated
                                                                       volt: 12,0
Timing-device characteristic:
                                                        valve
                                                        verflow : 82...112
quantity cm3/10s: (77...118)
                                                       Overflow.
               1/min: 600
1st speed
                  mm: 0,7...1,5
mm: (0,4...1,8)
TD travel
                                                       Delivery-quant. and breakaway char.:
KSB solenoid-operated
                                                       1st speed
                                                                      1/min: 2850
                                                       KSB solenoid-operated
 valve
               volt: 12.0
               1/min: 1000
                                                                       volt: 12,0
2nd speed
                                                        valve
                                                       Del.quantity cm5/: 1000H.: 0...7,0
                  mm: 2,3...3,1
mm: (2,0...3,4)
TD travel
KSB solenoid-operated
                                                                      1/min: 2700
                                                       2nd speed
              volt: 12,0
1/min: 1400
 valve
                                                       KSB solenoid-operated
                                                       valve volt: 12.0
Del.quantity cm3/: 10.5...16.5
1000H.: (9.5...17.5)
3rd speed
TD travel
                  mm: -
                  mm: (3.6...5.0)
                                                                      1/min: 2550
KSB solenoid-operated
                                                       3rd speed
 valve
               volt: 12,0
                                                       KSB solenoid-operated
              1/min: 2000
                                                        valve
                                                                       volt: 12,0
4th speed
E19
```

```
Del.quantity cm3/: 21,0...29,0
1000H.: (21,0...29,0)
                1/min: 2400
4th speed
KSB solenoid operated
                 volt: 12,0
 valve
Del.quantity cm3/: 29,7...32,3
1000H.: (28,7...33,3)
5th speed 1/min: 2100
5th speed
KSB solenoid-operated
valve volt: 12.0
Del.quantity cm3/: 20.3...32.7
1000H.: (29.2...33.8)
                1/min: 1400
6th speed
KSB solenoid-operated
                 volt: 12,0
 valve
Del.quantity cm3/: 27.8...29.8
1000H.: (26.5...31.1)
7th speed 1/min: 1000
7th speed
KSB solenoid-operated
 valve
                 volt: 12,0
Del.quantity cm3/: -
               1000H.: (26,7...31,3)
                1/min: 600
8th speed
KSB solenoid-operated
                 volt: 12,0
 valve
Del.quantity cm3/: 26,9...29,9
1000H: (25,4...31,4)
Zero delivery (stop):
Mech. shutoff:
Speed
                1/min: -
Del.quantity cm3/: -
               1000H.
Electr. shutoff:
                1/min: 425
Speed
ELAB
                 volt: -
Del.quantity cm3/: 3 1000H.
Idle delivery:
1st speed
                1/min: 425
KSB solenoid-operated
                 volt: 12,0
 valve
Del.quantity cm3/: -
1000H.: (4,0...12,0)
                1/min: 600
2nd speed
KSB solenoid-operated
valve volt: 12.0
Del.quantity cm3/: 0.5...5.5
1000H.: (0...6.0)
                1/min: 650
3rd speed
KSB solenoid-operated
                 volt: 12,0
 valve
Del.quantity cm3/: -
               1000H.: 0...3,0
Automatic starting fuel delivery:
```

1/min: 330 1st speed KSB solenoid-operated volt: 12.0 valve Del.quantity cm3/: -1000H: 30,0 ind. 2nd speed 1/min: 500 KSB solenoid-operated volt: 12,0 valve Del.quantity cm3/: -1000H: 31,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation 3,2...3,4 5,7...5,9 K mm **KF** mm

mm

mm

mm

mm

: 1,2...1,4

2.8 18.7..20.7 9,5...12,8

Remarks:

SVS max.

MS

XK

XL

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : PEU 2,3 K : 3.10.86 Edition : 9.85 replaces Calibrating oil : ISO-4113 : VE 4/9F2075 R126 Injection pump Type number : 0 460 494 121 Customer-specific information Speed Customer : PEUGEOT Engine : XD 3S TEST BENCH REQUIREMENTS Calibrating-oil oC Speed return temp. with thermometer : 40...48 : 42...50 electronically Inlet press., bar: 0.2 Calibrating nozzle-holder Speed assembly : 1 688 901 022 Opening bar: 130...133 pressure Test inj. tubing : 1 680 750 073 Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1500 Charge press. hPa: 800 Setting value mm: 5,8-6,2 Supply-pump pressure: Speed 1/min: 1500 Charge press. hPa: 800 Setting value bar: 5,6-6,2 full-load del. with charge press.: 1/min; 1500 Speed Charge press. hPa: 800 pressure

Del.quantity cm3/ 1000H.: 53_5-54,5 Dispersion cm3/: 2,51000H: -Full-load del. W/out charge press.: 1/min : 500 Del.quantity cm3/ 1000H.: 40,0-41,0 Low-idle speed regulation: 1/min: 350 Del.quantity cm3/ 1000H.: 20,0-24,0 cm3/: 2,0 Dispersion 1000H.: Full-load speed regulation: 1/min: 2300 Charge press. hPa: 800 Deliquantity cm3/ 1000H: 26,5-32,5 Start: 1/min: 100 Del.quantity mind. cm3/1000H.: 67,0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 750 Charge press. hPa: 800 TD travel mm: 0,8-1,6 mm: (0.5-1.9)1/min: 1000 2nd speed Charge press. hPa: 800 mm: 2,5-3,3mm: (2,2-3,6)TD travel 1/min: 1500 3rd speed Charge press. hPa: 800 TD travel mm: mm: (5,3-6,7)1/min: 2000 4th speed Charge press. hPa: 800 mm: 7_.8-8_{.6} TD travel mm: (7, 5-8, 9)Supply-pump pressure characteristic: 1st speed 1/min: 200 Charge press. hPa: 800 Supply-pump bar: 1,4-2,0

2nd speed 1/min: 750 Zero delivery (stop): Charge press. hPa: 800 Supply-pump Mech. shutoff: bar: 3,4-4,0 pressure Speed 1/min: -1/min: 2000 3rd speed Del.quantity cm3/: -1000H. Charge press. hPa: 800 Supply-pump bar: 7,1-7,7 pressure Electr. shutoff: 1/min: 400 Speed ELAB Overflow quantity at overflow valve: volt: -Del.quantity cm3/: - 1000H. 1/min: 500 1st speed Charge press. hPa: -Oveflow' : 41-83 Idle delivery: quantity cm3/10s: (26-98) 2nd speed 1/min: 2075 1st speed 1/min: 350 Del.quantity cm3/: -1000H.: (18,0-26,0) Charge press. hPa: 800 Overflow : 55-138 quantity cm3/10s: (40-153) 2nd speed 1/min: 400 Del.quantity cm3/: 8,0-12,0 1000H.: (6,0-14,0) Delivery-quant. and breakaway char.: 1/min: 500 1/min: 750 1st speed 3rd speed Del.quantity cm3/: -1000H.: 0...1,0 Charge-air pressure-setting point hPa: 300 LDA stroke mm: 4,5 Del.quantity cm3/: 47,5-48,5 1000H.: (45,8-50,2) Automatic starting fuel delivery: 1/min: 2600 2nd speed 1st speed 1/min: 230 Charge press. hPa: 800 cm3/: Del.quantity Del.quantity cm3/: -1000H.: 0...1,0 1000H: 60,0 ind. 3rd speed 1/min: 2300 2nd speed 1/min: 330 Charge press. hPa: 800 Del quantity cm3/: -Del.quantity cm3/: 26,5-32,5 1000H.: (25,5-33,5) 1000H: 60.0 1/min: 2200 4th speed Shutoff electromagnet: Charge press. hPa: 800 Del.quantity cm3/: 39,5-45,5 1000H.: (38,5-46,5) Cut-in : 10,0 min. voltage 1/min: 2000 5th speed : 12.0 Rated voltage Charge press. hPa: 800 Del.quantity cm3/: 52,0-54,0 1000H.: (50,8--55,2) 6th speed 1/min: 1500 Mounting and assembly dimensions: Designation Charge press. hPa: 800 : K1 mm Del.quantity cm3/: -1000H.: (51,8-56,2) KF : 5,4-5,7 mm : 1,2-1,4 MS min 1/min: 1000 : 4,6 SVS max. 7th speed mm : 20,2-22,2 Charge press. hPa: 800 XK mm Del.quantity cm3/: 50,5-53,5 XL mm : 9,7-13,1 1000H.: (49,8-54,2) 1/min: 750 8th speed Correction at adjusting nut (46) Charge press. hPa: Del.quantity cm3/: 41,5-44,5 1000H: (40,8-45,2) 1/min: 500 9th speed Charge press. hPa: -Del.quantity cm3/: 40,0-41,0

1000H: (38,3-42,7)

Del.quantity cm3/ 1000H.: 29,5...30,5 BOSCH-INJ.-PUMP TEST SPECIFICATIONS KSB solenoid-operated Note inst. in remarks column volt: 12,0 cm3/: 2,5 Dispersion Test sheet : FOR 1,6 A 1000H.: -Edition : 2.10.86 : 6.85 Low-idle speed regulation: replaces : ISO-4113 Calibrating oil 1/min: 440 Speed Del.quantity cm3/ 1000H.: 7,0...11,0 Injection pump : VE 4/9F2400 R125 : 0 460 494 122 Type number KSB solenoid-operated Customer-specific information volt: 12.0 valve Customer : FORD-KENT Dispersion cm3/: 2.01000H .: -Engine : 1,6L IDI Full-load speed regulation: TEST BENCH REQUIREMENTS Speed 1/min: 2675 Del.quantity cm3/ Calibrating-oil C 1000H: 7,5...13,5 return temp. KSB solenoid-operated with thermometer : 40...48 valve volt: 12.0 : 42...50 electronically Start: Inlet press., bar : 0.2 Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 50,0 Calibrating nozzle-holder : 1 688 901 022 assembly KSB solenoid-operated / volt: 12,0 Opening valve bar : 130...133 pressure Inspection-pump test specifications Test specifications in parentheses Test inj. tubing : 1 680 750 073 Outside diameter : 6 Timing-device characteristic: x Wall thickness : 2 mm : 450 1/min: 800 x Length 1st speed mm: 1,6...2,4 TD travel mm: (1,3...2,7)Injection-pump setting values Test specifications in parentheses KSB solenoid-operated volt: 12.0 1/min: 1500 valve Timing-device travel: 2nd speed TD travel mm: 1/min: 1500 mm: (4,5...5,9)Setting value mm: 5,0...5,4 KSB solenoid-operated KSB solenoid-operated volt: 12.0 valve 3rd speed 1/min: 2000 volt: 12,0 mm: 7,6...8,4 mm: (7,3...8,7) TD travel Supply-pump pressure: KSB solenoid-operated volt: 12,0 Speed 1/min: 1500 Setting value bar: 5,3...5,9 valve 1/min: 600 4th speed KSB solenoid-operated TD travel mm: 2,2...4,2 mm: valve volt: 12,0 KSB solenoid-operated Full-load del. w/out charge press.: valve volt: -Speed 1/min : 1750 Supply-pump pressure characteristic: E24

	Del.quantity cm3/: 24,027,0
1st speed 1/min: 600	1000H.: (22,528,5)
Supply-pump I	
pressure bar: 3,13,7	Zero delivery (stop):
KSB solenoid-operated	•
valve volt: 12,0	Mech. shutoff:
2nd speed 1/min: 2000 I	Speed 1/min: 2400
Supply-pump !	Del.quantity cm3/: -
pressure bar: 6,67,2	1000H.
KSB solenoid-operated	
valve volt: 12,0	Idle delivery:
Overflow quantity at overflow valve:	1st speed 1/min: 440
	KSB solenoid-operated
1st speed 1/min: 600	valve volt: 12,0
KSB solenoid-operated	Del.quantity cm3/: -
valve volt: 12,0	1000H.: (5,013,0)
Oveflow : 4183	2nd speed 1/min: 475
quantity cm3/10s: (2698)	KSB solenoid-operated
2nd speed 1/min: 2400	valve volt: 12,0
KSB solenoid-operated	Del.quantity cm3/: 2,57,5
valve volt: 12,0	1000H.: (1,09,0)
Overflow : 55138	
quantity cm3/10s: (40153)	
qualitative classifies: (40.2.155)	KSB solenoid-operated
Delivery and backers, about	valve volt: 12,0
Delivery-quant, and breakaway char:	Del.quantity cm3/: -
1st speed 1/min: 2950	1000H.: 03,5
KSB solenoid-operated	A. A A
valve volt: 12,0	Automatic starting fuel delivery:
Del.quantity cm3/: -	
1000H.: 02,0	1st speed 1/min: 400
2nd speed 1/min: 2675	KSB solenoid-operated
KSB solenoid-operated	valve volt: 12,0
valve volt: 12,0	Del.quantity cm3/: - ind. 1000H: 30,0
Del.quantity cm3/: -	ind. 1000H: 30,0
1000H.: (6,514,5)	
3rd speed 1/min: 2550 l	2nd speed 1/min: 500
KSB solenoid-operated I	KSB solenoid-operated
valve volt: 12,0	valve volt: 12,0
Del.quantity cm3/: 18,526,5	Del.quantity cm3/: -
1000H.: (18,526,5)	ax. 1000H: 30,0
4th speed 1/min: 2400	
KSB solenoid-operated !	Shutoff electromagnet:
valve volt: 12.0	3
valve volt: 12,0 Del.quantity cm3/: 28,130,1	Cut-in
1000H.: (26,931,3) i	min. voltage : 10,0
5th speed 1/min: 1750	Rated voltage : 12,0
KSB solenoid-operated	nacou voteago
valve volt: 12,0	Mounting and assembly dimensions:
Del.quantity cm3/: -	rioditettig and assembly atmensions.
1000H.: (27,832,2	Decionation
	Designation K mm: 3,2-3,4
6th speed 1/min: 1000	VC 5 7-6 0
KSB solenoid-operated	KF mm: 5,7-6,0
valve volt: 12,0	MS mm : 1,6-1,85
Del.quantity cm3/: 26,029,0	SVS max. mm : 3,4
1000H.: (25,329,7)	XK mm : 23,3-25,3
7th speed 1/min: 600	XL mm: 10,4-13,8
KSB solenoid-operated	
valve volt: 12,0	Remarks:

Note inst. in remarks column

Test sheet : PEU 2.3K3
Edition : 3.10.86
replaces : 9.85

Calibrating oil : ISO-4113

Injection pump : VE 4/9F2125 R126-1 Type number : 0 460 494 123

Customer-specific information Customer : PEUGEOT

Engine : XD3S AUT.

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

With thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 800 Del.quantity cm3/ 1000H.: 53,5...54,5 Dispersion cm3/: 2,5 1/min: 750 2nd speed hPa: 800 Charge press. Supply-pump bar: 3,4...4,0 1000H : pressure 1/min: 2000 3rd speed Full-load del. w/out charge press.: Charge press. hPa: 800 Supply-pump Speed 1/min : 500 bar: 7,1...7,7 pressure Deliquantity cm3/ 1000H.: 40,0...41,0 Overflow quantity at overflow valve: Low-idle speed regulation: 1/min: 500 1st speed Charge press. hPa: -1/min: 400 Oveflow quantity cm3/10s: (26...98) Del quantity cm3/ 1000H.: 17,0...21,0 2nd speed 1/min: 2125 : 55...138 cm3/: 2,0 Overflow Dispersion quantity cm3/10s: (40...153) 1000H.: -Full-load speed regulation: Delivery-quant. and breakaway char.: 1st speed 1/min: 2350 1/min: 750 Speed Charge press. hPa: 800 Charge-air pressure-setting Del.quantity cm3/ hPa: 300 point LDA stroke mm: 4.5 Del.quantity cm3/: 47.5...48.5 1000H.: (45.8...50.2) 1000H: 26,5...32,5 Start: 1/min: 2650 2nd speed Charge press. hPa: 800
Del.quantity cm3/: 1000H.: 0...1.0 Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 67,0 1/min: 2350 3rd speed Charge press. hPa: 800
Del.quantity cm3/: 1000H.: (25,5...33,,5 Inspection-pump test specifications Test specifications in parentheses 1/min: 2250 4th speed Charge press. hPa: 800
Del.quantity cm3/: 38,5...44,5
1000H.: (37,5...45,5)
5th speed 1/min: 2000 Timing-device characteristic: 1st speed 1/min: 750 Charge press. hPa: 800 mm: 0,8...1,6 Charge press. hPa: 800 TD travel Del.quantity cm3/: 52.0...54.0 1000H.: (50.8...55.2) 6th speed 1/min: 1500 mm: (0,5...1,9)1/min: 1000 2nd speed Charge press. hPa: 800 6th speed Charge press. hPa: 800 Del.quantity cm3/: -1000H.: (51,8...56,2) mm: 2,5...3,3 mm: (2,2...3,6) TD travel 3rd speed 1/min: 1500 1/min: 1000 Charge press. hPa: 800 7th speed Charge press. hPa: 800 Del.quantity cm3/: 50,5...53,5 1000H.: (49,8...54,2) TD travel mm: mm: (5,3...6,7) 1/min: 2000 4th speed 1/min: 750 Charge press. hPa: 800 8th speed mm: 7,8...8,6 mm: (7,5...8,9) TD travel Charge press. hPa: Del.quantity cm3/: 41.5...44.5 1000H: (40.8...45.2) 1/min: 500 Supply-pump pressure characteristic: 9th speed Charge press. hPa: -Deliquantity cm3/: -1st speed 1/min: 200 hPa: 800 1000H: (38,3...42,7) Charge press. Supply-pump bar: 1,4...2,0 Zero delivery (stop): pressure **E27**

```
Mech. shutoff:
Speed
              1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
              1/min: 400
Speed
Del.quantity....cm3/: -
Idle delivery:
              1/min: 400
1st speed
Del.quantity cm3/: -
1000H.: (15,0..23,0)
              1/min: 450
2nd speed
Del.quantity cm3/: 5.0...9.0
1000H.: (3.0...11.0)
3rd speed 1/min: 550
Del.quantity cm3/: -
1000H.: 0...3,5
Automatic starting fuel delivery:
              1/min: 230
1st speed
Del.quantity cm3/: -
               1000H: 60,0
 ind.
2nd speed
              1/min: 330
Del.quantity cm3/: -
              1000H: 60,0
Shutoff electromagnet:
Cut-in
min. voltage
                    : 10,0
                    : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                    : K1
               mm
KF
                   : 5,4...5,7
               mm
MS
                   : 1,2...1,4
               mm
                   : 4,6
SVS max.
               mm
                   : 20,2...22,2
XK
               mm
XL
               mm
                   : 9,4...12,8
Correction at adjusting nut (46)
```

minimi

£28

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column 1/min: 400 Speed Del.quantity cm3/ 1000H.: 6,0...10,0 : PEU 2,5 A 1 : 10.12.86 Test sheet cm3/: 2,5 1000H.: (3,0) Edition Dispersion : 9.85 replaces Calibrating oil : ISO-4113 Full-load speed regulation: : VE 4/9F2250 R84-1 Injection pump 1/min: 2325 Speed : 0 460 494 125 Del.quantity cm3/ Type number 1000H: 25,5...31,5 Customer-specific information Customer : PEUGEOT Start: : XD3 505 D Engine 1/min: 100 Speed Del.quantity mind. TEST BENCH REQUIREMENTS cm3/1000H.: 45.0 Calibrating-oil Load-dependent start of delivery: return temp. with thermometer : 40...48 Speed 1/min: 1250 : 42...50 electronically Inspection-pump test specifications Inlet press., bar: 0.2 Test specifications in parentheses Calibrating nozzle-holder : 1 688 901 022 assembly Timing-device characteristic: Opening 1/min: 700 1st speed mm: 0,6...1,4 mm: (0,3...1,7) 1/min: 1250 pressure bar : 130...133 TD travel 2nd speed Test inj. tubing : 1 680 750 073 TD travel mm: mm: (3,5...4,9)1/min: 2000 Outside diameter : 6 3rd speed mm: 8,1...8,9 mm: (7,8...9,2) x Wall thickness TD travel mm: 450 x Length Injection-pump setting values Supply-pump pressure characteristic: Test specifications in parentheses 1/min: 400 1st speed Timing-device travel: Supply-pump pressure bar: 2.1...2,7 1/min: 2200 1/min: 1250 2nd speed Setting value mm: 4,0...4,4 Supply-pump bar: 7,5...8,1 pressure Supply-pump pressure: Overflow quantity at overflow valve: 1/min: 1250 1/min: 400 Setting value bar: 5,0...5,6 1st speed Oveflow : 41...83 cm3/10s: (26...98) Full-load del. w/out charge press.: quantity 1/min: 2250 2nd speed 1/min : 1250 Over flow : 55...138 Speed Del.quantity cm3/ quantity cm3/10s: (40...153) 1000H.: 38,5...39,5 cm3/: 2,5 1000H.: (3,0) Delivery-quant. and breakaway char.: Dispersion 1st speed 1/min: 2550 F01

```
Del.quantity cm3/: -
1000H.: 0...2,0
               1/min: 2450
2nd speed
Del.quantity cm3/: 4.5...12.5
1000H.: (4.5...12.5
3rd speed 1/min: 2325
3rd speed
Deliquantity cm3/:
              1000H.: (24,5...32,5)
               1/min: 2200
4th speed
Del.quantity cm3/: 39,0...41,0
1000H.: (37,8...42,2)
               1/min: 2000
5th speed
Del.quantity cm3/: 38,5...40,5
1000H.: (37,3...41,7)
6th speed 1/min: 1250
Deliquantity cm3/:
              1000H.: (36,8...41,2)
               1/min: 600
7th speed
Del.quantity cm3/: 35,5...39,5
1000H.: (34,0...40,0)
Zero delivery (stop):
Mech. shutoff:
               1/min: -
Speed
Deliquantity cm3/: -
              1000H.
Idle delivery:
1st speed
               1/min: 400
Del.quantity cm3/: -
1000H.: (4,0...12,0)
               1/min: 440
2nd speed
               .cm3/: -
Del.quantity
              1000H.: 0...2,0
Automatic starting fuel delivery:
1st speed
               1/min: 350
Del.quantity cm3/: -
               1000H: 45,0
 ind.
2nd speed
               1/min: 450
Del.quantity cm3/: -
               1000H: 45,0
Shutoff electromagnet:
Cut-in
                     : 10,0
min. voltage
                     : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                     : K1
                mm
                     : 5,2-5,4
KF
                mm
                     : 0,9-1,2
MS
                mm
                     : 3,3
SVS max.
                mm
F02
```

XK mm : 20,2-22,2 XL mm : 9,9-13,3

Note inst. in remarks column

Test sheet : FIA 1,9 E : 16.12.86 Edition replaces : 9.85 Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R141 Type number : 0 460 494 132

Customer-specific information

Customer : FIAT

: X8/43 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 022 assembly '

Opening |

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1500 Speed Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

1/min : 1500 Speed

Del.quantity cm3/

1000H.: 29,2...30,2 cm3/: 2,5 1000H.: (3,0) Dispersion

!	Del.quantity cm3/: 3,010,0
Low-idle speed regulation:	1000H.: (2,510,5) 3rd speed 1/min: 2500
Speed 1/min: 390	Del.quantity cm3/: -
Deliquantity cm3/	1000H.: (10,018,0)
1000H.: 9,013,0	4th speed 1/min: 2400
Dispersion cm3/: 2,5	Del.quantity cm3/: 21,027,0
1000H.: (3,0) Full-load speed regulation:	1000H.: (20,028,0) 5th speed 1/min: 2250
That toda speed regarderon.	Del.quantity cm3/: 31,033,4
Speed 1/min: 2500	1000H.: (30,,034,4)
Del.quantity cm3/	6th speed 1/min: 1500
1000H: 11,017,0	Del.quantity cm3/: - 1000H.: (26,531,9)
Start:	7th speed 1/min: 1000
1	Del.quantity cm3/: 28,931,5
Speed 1/min: 100	1000H.: (28,032,4)
Del.quantity mind. cm3/1000H.: 55,0	8th speed 1/min: 600
CIII3/ 1000II 22,0	Del.quantity cm3/: 30,033,0 1000H: (28,534,5)
Load-dependent start of delivery:	100011. (20)311101,37
	Zero delivery (stop):
Speed 1/min: 1500	tioch shutseff.
Inspection-pump test specifications	Mech. shutoff: Speed 1/min: 2300
Test specifications in parentheses	Del.quantity cm3/: -
<u> </u>	Del.quantity cm3/: - 1000H.
Timin and devices observations	Idle deliverye
Timing-device characteristic:	Idle delivery:
1st speed 1/min: 800	1st speed 1/min: 390
TD travel mm: 1,72,5	Del.quantity cm3/: - 1000H.: (7,015,0)
mm: (1,42,8) 2nd speed	2nd speed 1/min: 440
2nd speed	2nd speed 1/min: 440 Del.guantity cm3/: 1.07.0
mm: (3,85,2)	Del.quantity cm3/: 1,07.0 1000H.: (08,0)
3rd speed 1/min: 2300	3rd speed 1/min: 500
TD travel mm: 7,17,9 mm: (6,88,2)	Del.quantity cm3/: - 1000H.: 02,5
iiiii. (0,00,2/	100011. 02,5
Supply-pump pressure characteristic:	Automatic starting fuel delivery:
	Ant aread Africa 700
1st speed 1/min: 400 Supply-pump	1st speed
pressure bar: 2,83,4	ind. 1000H: 45,0
2nd speed 1/min: 2300	
Supply-pump	2nd speed 1/min: 400
pressure bar: 7,48,0	Del.quantity cm3/: - ax. 1000H: 46,0
Overflow quantity at overflow valve:	and recons repe
	Shutoff electromagnet:
1 1st speed 1/min: 400	Cut-in
Oveflow : 4183 quantity cm3/10s: (2698)	Cut-in min. voltage : 10,0
2nd speed 1/min: 2300	Rated voltage : 12,0
Overflow : 55138	
quantity cm3/10s: (40153)	Mounting and assembly dimensions:
Delivery-quant. and breakaway char.:	Designation
1st speed 1/min: 2600	K mm : 3,13,4
	•

KF MS SVS max. XK XL mm mm

mm

: 5,7...6,0 : 1,7...1,9 : 2,8 : 20,2...22,2 : 10,3...13,7 mm mm

Note inst. in remarks column

Test sheet : REN 2.0 K
Edition : 02.04.87
replaces : 10.84
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2200 R153 Type number : 0 460 494 141

Customer-specific information Customer : RENAULT

Engine : J8S-709

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400 Charge press. hPa: 800 Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400 Charge press. hPa: 800 Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/ 1000H.: 48,2...49,2 Dispersion cm3/: 2,5 1/min: 1800 2nd speed hPa: 800 Charge press. Supply-pump bar: 6,3...6,9 1000H : pressure Full-load del. w/out charge press.: Overflow quantity at overflow valve: Speed 1/min : 600 1st speed 1/min: 600 Del.quantity cm3/ Charge press. hPa: -1000H.: 37,6...38,6 Oveflow | : 41...83 quantity cm3/10s: (26...98) 2nd speed 1/min: 2000 Low-idle speed regulation: Charge press. hPa: 800 1/min: 350 Over flow : 55...138 Speed quantity cm3/10s: (40...153) Del.quantity cm3/ 1000H.: 9,0...13,0 Dispersion cm3/: 2,5 Delivery-quant. and breakaway char.: 1000H.: -1st speed 1/min: 700 Full-load speed regulation: Charge-air pressure-setting hPa: 200 point LDA stroke mm: 4.5 Del.quantity cm3/: 41.5...42.5 1000H.: (39.0...45.0) 1/min: 2400 Speed Charge press. hPa: 800 Del.quantity cm3/ 1/min: 2700 1000H: 23,0...29,0 2nd speed Charge press. hPa: 800 Del.quantity cm3/: -1000H.: 0...3,0 Start: 1/min: 2500 3rd speed Speed 1/min: 100 Charge press. hPa: 800 Del.quantity mind. Del. quantity cm3/: -1000H.: 0...17,5 cm3/1000H.: 60.0 1/min: 2400 4th speed Inspection-pump test specifications Test specifications in parentheses Charge press. hPa: 800 Del.quantity cm3/: 1000H.: (22,0...30,0)
5th speed 1/min: 2000 Timing-device characteristic: Charge press. hPa: 800 Del.quantity cm3/: 44,5...46,5 1000H.: (43,2...47,8) 1/min: 1000 1st speed Charge press. hPa: 800 mm: 1,9...2,7 mm: (1,6...3,0) 1/min: 1400 TD travel 6th speed Charge press. hPa: 800 Del.quantity cm3/: 1000H: (46,4...51,0)
7th speed 1/min: 1000
Charge press. hPa: 800 2nd speed 1/min: 1400 Charge press. hPa: 800 TD travel mm: mm: (3,5...4,9)Del.quantity cm3/: 46.2...49.2 1000H.: (44.7...50,7) 1/min: 1800 3rd speed Charge press. hPa: 800 mm: 5.7...6.5 mm: (5.4...6.8) 1/min: 600 TD travel 8th speed Charge press. hPa: -Del.quantity cm3/: 37.6...38.6 1000H: (35,1...41,1) 1/min: 2000 4th speed Charge press. hPa: 800 mm: 6,2...7,0 mm: (5,9...7,3) TD travel Zero delivery (stop): Mech. shutoff: Supply-pump pressure characteristic: 1/min: -Speed Del.quantity cm3/: - 1000H. 1/min: 600 1st speed Charge press. hPa: 800 Supply-pump bar: 2,7...3,2 Electr. shutoff: pressure F07

```
Speed
               1/min: 350
ELAB
                volt:
Del.quantity cm3/
1000H.
                cm3/: 3
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: -
1000H.: (7,0...15,0)
2nd speed 1/min: 375
Del.quantity cm3/: 4,0...8,0
1000H.: (2,0...10,0)
               1/min: 480
3rd speed
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel delive y:
               1/min: 180
1st speed
Del.quantity cm3/: -
               1000H: 40,0
 ind.
               1/min: 300
2nd speed
Del.quantity cm3/: -
               1000H: 40,0
 ax.
Shutoff electromagnet:
Cut-in
                     : 10,0
 min. voltage
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
Designation
                     : 3,2...3,4 : 5,7...6,0
K
                mm
KF
                mm
MS
                     : 1,4...1,6
                mm
                     : 3,6
: 17,0...19,0
SVS max.
                mm
XK
                mm
XL
                     : 10,3...13,7
                mm
Correction at adjusting nut (46)
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column 1/min: 400 Speed Del.quantity cm3/ 1000H.: 9,0...13,0 : FIA 1,9 D Test sheet cm3/: 2,0 : 16.12.86 Edition Dispersion replaces : 3.84 1000H.: (3,0) : ISO 4113 Full-load speed regulation: Calibrating oil : VE 4/9F2300 L157 1/min: 2400 Injection pump Speed Del.quantity cm3/ 1000H: 24,0...30,0 Type number : 0 460 494 144 Customer-specific information Customer : FIAT Start: : X8/48 Engine Speed 1/min: 100 Del.quantity mind. TEST BENCH REQUIREMENTS cm3/1000H.: 57.0 Calibrating-oil C Load-dependent start of delivery: return temp. with thermometer : 40...48 1/min: 1500 Speed : 42...50 electronically Inspection-pump test specifications Inlet press., bar: 0.2 Test specifications in parentheses Calibrating nozzle-holder : 1 688 901 022 assembly Timing-device characteristic: 1/min: 800 Opening 1st speed bar: 130...133 TD travel mm: 0,7...1,5 pressure mm: (0,4...1,8) 1/min: 1500 2nd speed Test inj. tubing : 1 680 750 073 TD travel mm : mm: (3,9...5,3) 1/min: 2300 Outside diameter : 6 3rd speed mm: 8,2...9,0 mm: (7,9...9,3) x Wall thickness : 2 TD travel mm: 450 x Length Supply-pump pressure characteristic: Injection-pump setting values Test specifications in parentheses 1st speed 1/min: 400 Supply-pump Timing-device travel: bar: 2,5...3,1 1/min: 2300 pressure 1/min: 1500 2nd speed Setting value mm: 4,4...4,8 Supply-pump pressure bar: 6,9...7,5 Supply-pump pressure: Overflow quantity at overflow valve: Speed 1/min: 1500 1/min: 400 Setting value bar: 5,1...5,7 1st speed Oveflow | : 41...83 cm3/10s: (26...98) 1/min: 2300 quantity Full-load del. w/out charge press.: 2nd speed 1/min : 1500 Over flow : 55...138 Speed Del.quantity cm3/ quantity cm3/10s: (40...153) 1000H.: 33.0...34,0 cm3/: 2.5 1000H.: (3,0) Delivery-quant. and breakaway char.: Dispersion 1st speed 1/min: -F09

```
Del.quantity cm3/: 1000H.:
                                               1/min: 2600
  2nd speed
 Del.quantity 0±3/: 3,0...9,0
                                            1/min: 2500
  3rd speed
                                            cm3/: 14,0...20,0
1000H.: (13,0...21,0)
  Del.quantity
                                                1/min: 2400
  4th speed
The Special Sp
                                                1/min: 1500
  6th speed
 Del.quantity cm3/: -
1000H.: (31,3...35,7)
                                               1/min: 1900
  7th speed
                                            cm3/: 32,7...35,3
1000H.: (31,8...36,2)
 Del.quantity
  8th speed
                                                1/min: 600
 Del.quantity cm3/: 34,0...37,0
                                               1000H: (32,5...38,5)
 Zero delivery (stop):
 Mech. shutoff:
                                                1/min: 2300
  Speed
 Del.quantity cm3/: - 1000H.
  Idle delivery:
  1st speed
                                               1/min: 400
 Del.quantity cm3/: 9,0...13,0
1000H.: (7,0...15,0)
                                               1/min: 450
 2nd speed
 Del.quantity cm3/: 0,5...6,5
1000H.: (0...7,5)
                                               1/min: 500
  3rd speed
 Del.quantity cm3/: -
                                            1000H.: 0...2,0
 Automatic starting fuel delivery:
                                               1/min: 300
  1st speed
 Del.quantity cm3/: -
    ind.
                                                1000H: 50,0
 2nd speed
                                               1/min: 450
 Del.quantity cm3/: -
                                               1000H: 46,0
    ax.
 Shutoff electromagnet:
 Cut-in
    min. voltage
                                                                 : 10,0
 Rated voltage
                                                                : 12,0
```

Mounting and assembly dimensions:

F10

Designation : 3,1...3,4 : 5,7...6,0 K mm KF mm : 1,4..1,65 MS mm : 2.8 : 25.0...27.0 SVS max. mm ХK mm XL mm : 9,2...12,6

Remarks:

Note inst. in remarks column

Test sheet : REN 2,OF : 02.04.87 Edition replaces : 9.85 Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R158 Type number : 0 460 494 145

Customer-specific information Customer : RENAULT

: J8S-706 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.3

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening |

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1400 Setting value mm: 4,4...4,8

Supply-pump pressure:

1/min: 1400 Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

1/min : 1400 Speed

Del.quantity cm3/ 1000H.: 35.0...36.0 Dispersion cm3/: 2.5 1000H.: (3.0)

Del.quantity cm3/: -1000H.: 0...5,0 Low-idle speed regulation: 1/min: 2400 3rd speed Del.quantity cm3/: -1000H.: (16,0...24,0) 1/min: 425 Speed Deliquantity cm3/ 1000H.: 7,0...11,0 1/min: 2200 4th speed Del. quantity cm3/: 37.0...39.0 1000H.: (35.7...40,3) 5th speed 1/min: 2100 Del. quantity cm3/: 37.5...39.5 1000H.: (36.2...40,8) 6th speed 1/min: 1400 cm3/: 2.5 1000H.: (3,0) Dispersion Full-load speed regulation: 1/min: 2400 Speed Del.quantity cm3/ Del.quantity cm3/: -1000H.: (33,2...37,8) 1000H: 17,0...23,0 1/min: 1000 7th speed Start: Del.quantity cm3/: 34,0...37,0 1000H.: (33,2...37,8) 1/min: 100 Speed Del.quantity mind. cm3/1000H.: 52,0 Zero delivery (stop): Load-dependent start of delivery: Mech. shutoff: Speed 1/min: -Del.quantity cm3/: - 1000H. Speed 1/min: 1400 Inspection-pump test specifications Test specifications in parentheses Electr. shutoff: 1/min: 425 Speed Del.quantity cm3/: 3 1000H. Timing-device characteristic: 1/min: 1000 1st speed Idle delivery: mm: 2,6...3,4 mm: (1,3...3,7) TD travel 1/min: 425 1st speed Del.quantity cm3/: -1000H.: (5,0...13,0) 2nd speed 1/min: 1400 TD travel mm: mm: (3,9...5,3) 1/min: 650 2nd speed 1/min: 2000 Del.quantity cm3/: -1000H.: 0...5,0 3rd speed mm: 6,7...7,5 mm: (6,4...7,8) TD travel Automatic starting fuel delivery: Supply-pump pressure characteristic: 1st speed 1/min: 370 Del.quantity cm3/: -1st speed 1/min: 1000 1000H: 45,0 Supply-pump ind. bar: 3,9...4,5 1/min: 2000 pressure 2nd speed 1/min: 480 2nd speed Del.quantity cm3/: -Supply-pump 1000H: 45,0 pressure bar: 6,5...7,1 Overflow quantity at overflow valve: Shutoff electromagnet: 1/min: 1000 1st speed Cut-in Oveflow : 55...70 : 10,0 min. voltage quantity cm3/10s: -Rated voltage : 12,0 1/min: 2200 2nd speed Over flow : 82...112 Mounting and assembly dimensions: quantity cm3/10s: -Designation : 3,2...3,4 : 5,7...5,9 Delivery-quant. and breakaway char.: **KF** 1st speed 1/min: 2550 mm F12

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41111111

Remarks:

Note inst. in remarks column

Test sheet : VWW 1,6 W18 Edition : 10.12.86 replaces : 12.85 Calibrating oil : ISO-4113

Injection pump : VE 4/9F2250 R170 Type number : 0 460 494 152

Customer-specific information

Customer : VW

Engine : 162 T -1,6L TURBO

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840

Start of delivery

Prestroke mm: 0,2

(from BDC): +/-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 750 Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 750 Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Supply-pump bar: 2,5...3,1 1/min: 2250 Speed 1/min: 1500 pressure Charge press. hPa: 750 2nd speed Deliquantity cm3/ hPa: 750 Charge press. 1000H.: 42,5...43,5 cm3/: 2,5 1000H: (3,0) Supply-pump bar: 6,9...7,5 Dispersion pressure Overflow quantity at overflow valve: Full-load del. w/out charge press.: 1st speed 1/min: 600 Charge press. hPa: 750 Speed 1/min : 600 Del.quantity cm3/ : 41...83 quantity cm3/10s: (26...98)
2nd speed 1/min: 2250
Charge press. hPa: 750
Overflow : 55...138 1000H.: 25,0...26,0 Low-idle speed regulation: Speed 1/min: 415 Charge press. hPa: 750 quantity cm3/10s: (40...153) Del.quantity cm3/ Delivery-quant. and breakaway char.: 1000H.: 6,0...10,0 1/min: 900 1st speed cm3/: 2,0 1000H.: (3,0) Dispersion Charge-air pressure-setting hPa: 300 point Del.quantity cm3/: 36,0...37,0 1000H.: (34,3...38,7) 2nd speed 1/min: 2650 Charge press. hPa: 750 Del.quantity cm3/: -1000H.: 0...4,0 3rd speed 1/min: 2525 Charge press. hPa: 750 Full-load speed regulation: Speed 1/min: 2525 Charge press. hPa: 750 Del.quantity cm3/ 1000H: 13,0...19,0 Charge press. hPa: 750
Del.quantity cm3/: 13.0...19.0
1000H.: (12.0...20.0) Start: Speed 1/min: 100 Charge press. hPa: 750 4th speed 1/min: 2250 Charge press. hPa: 750 Del.quantity cm3/: 35,0...37,0 1000H.: (33,8...38,2) 5th speed 1/min: 1500 Del.quantity mind. cm3/1000H.: 35,0 Inspection-pump test specifications Charge press. hPa: 750 Test specifications in parentheses Del.quantity cm3/: -1000H.: (40,8...45,2) 6th speed 1/min: 600 Charge press. hPa: 750 Del.quantity cm3/: 34,8...37,8 1000H.: (33,3...39,3) Timing-device characteristic: 1/min: 900 1st speed Charge press. hPa: 750 mm: 1,6...2,4 mm: (1,3...2,7) 1/min: 600 TD travel 7th speed Charge press. hPa: Del.quantity cm3/: 1000H.: (23,3...27,7) 1/min: 1500 2nd speed Charge press. hPa: 750 TD travel mm: mm: (3,3...4,7) 1/min: 2250 Zero delivery (stop): 3rd speed Charge press. hPa: 750 Mech. shutoff: mm: 6,4...7,2 mm: (6,1...7,5) 1/min: -TD travel Del.quantity cm3/: - 1000H. Supply-pump pressure characteristic: Electr. shutoff: 1/min: 400 1st speed 1/min: 600 Del.quantity cm3/: - 1000H. Charge press. hPa: 750

```
Idle delivery:
1st speed
               1/min: 415
Del.quantity cm3/: -
1000H.: (4.0...12.0)
2nd speed 1/min: 1000
2nd speed
KSB solenoid-operated
valve
                volt: 1000
Del.quantity cm3/: -
1000H.: 0...3,0
Automatic starting fuel delivery:
1st speed 1/min: 400
Charge press. hPa: 750
Del.quantity cm3/: -
ind. 1000H: 29,5
               1/min: 500
2nd speed
Charge press. hPa: 750
Del.quantity cm3/: -
ax. 1000H: 37,5
Shutoff electromagnet:
Cut-in
min. voltage : 10.0
                    : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
KF
                    : 5,7...6,0
                mm
MS
                mm : 1, 2, ..., 4
```

Remarks:

Note inst. in remarks column

Test sheet : PEU 2,3K1 Edition replaces : 3.10.86 : 9.85 Calibrating oil : ISO-4113

Injection pump : VE 4/9F2075 R126-2 Type number : 0 460 494 155

Customer-specific information Customer : PEUGEOT

Engine : XD3S

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 800

Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 800

```
Del.quantity cm3/
1000H.: 53,5...54,5
Dispersion cm3/: 2,5
                                                         Charge press. hPa: 800
                                                         Supply-pump
                                                                         bar: 3,4...4,0
1/min: 2000
                                                          pressure
              1000H : -
                                                          3rd speed
                                                                          hPa: 800
                                                         Charge press.
Full-load del. w/out charge press.:
                                                         Supply-pump
                                                                           bar: 7,1...7,7
                                                          pressure
              1/min : 500
Speed
Del.quantity cm3/
                                                         Overflow quantity at overflow valve:
              1000H.: 40,0...41,0
                                                         1st speed
Oveflow
                                                                         1/min: 500
Low-idle speed regulation:
                                                                               : 41...83
                                                                      cm3/10s: (26...98)
1/min: 2075
                                                           quantity
                                                         2nd speed
Speed
               1/min: 350
                                                                              : 55...138
Del.quantity cm3/
                                                         Overflow
              1000H.: 20,0...24,0
                                                           quantity cm3/10s: (40...153)
Dispersion
                cm3/: 2,0
              1000H.: -
                                                         Delivery-quant. and breakaway char.:
                                                         1st speed
                                                                      1/min: 750
Full-load speed regulation:
                                                         Charge-air pressure-setting
               1/min: 2300
                                                           point
                                                                          hPa: 300
Speed
                                                         LDA stroke mm: 4.5
Del.quantity cm3/: 47.5...48.5
1000H.: (45.8...50.2)
Charge press. hPa: 800
Del.quantity cm3/
               1000H: 26,5...32,5
                                                                         1/min: 2600
                                                         2nd speed
Start:
                                                         Charge press. hPa: 800
                                                         Del.quantity cm3/: -
1000H.: 0...1,0
Speed
               1/min: 100
                                                                        1/min: 2300
Del.quantity mind.
                                                         3rd speed
         cm3/1000H.: 67_0
                                                         Charge press. hPa: 800
                                                         Del.quantity cm3/: -
1000H.: (25,5...33,5)
Inspection-pump test specifications
                                                                        1/min: 2200
Test specifications in parentheses
                                                         4th speed
                                                         Charge press. hPa: 800
                                                         Del.quantity cm3/: 39.5...45.5
1000H.: (38.5...46.5)
Timing-device characteristic:
                                                                        1/min: 2000
                                                         5th speed
                                                         Charge press. hPa: 800
               1/min: 750
1st speed
                                                         Del.quantity cm3/: 52.0...54.0
1000H.: (50.8...55.2)
6th speed 1/min: 1500
Charge press. hPa: 800
                   mm: 0,8...1,6
TD travel
                   mm: (0,5...1,9)
               1/min: 1000
                                                         Charge press. hPa: 800
2nd speed
                                                         Del.quantity cm3/: -
1000H.: (51,8...56,2)
Charge press. hPa: 800
                  mm: 2,5...3,3
mm: (2,2...3,6)
TD travel
                                                                        1/min: 1000
                                                         7th speed
                                                         Charge press. hPa: 800
Del.quantity cm3/: 50.5...53.5
1000H.: (49,8...54,2)
               1/min: 1500
3rd speed
TD travel
                   mm:
                   mm: (5,3...6,7)
               1/min: 2000
                                                         8th speed
                                                                        1/min: 750
4th speed
Charge press. hPa: 800
                                                         Charge press.
                                                                          hPa:
                  mm: 7,8...8,6
mm: (7,5...8,9)
                                                         Del.quantity cm3/: 41,5...44,5
1000H: (40,8...45,2)
TD travel
                                                                        1/min: 500
                                                         9th speed
Supply-pump pressure characteristic:
                                                         Charge press. hPa:
                                                         Del.quantity cm3/: -
                                                                        1000H: (38,3...42,7)
               1/min: 200
1st speed
Charge press. hPa: 800
Supply-pump
                                                         Zero delivery (stop):
               bar: 1,4...2,0
1/min: 750
 pressure
2nd speed
                                                         Mech. shutoff:
```

F18

```
Speed
               1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
Speed
              1/min: 400
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 350
Del.quantity cm3/: -
1000H.: (18,0..26,0)
               1/min: 400
2nd speed
Del.quantity cm3/: 8,0...12,0
1000H.: (6,0...14,0)
               1/min: 500
3rd speed
Del.quantity cm3/: -
1000H.: 0...1,0
Automatic starting fuel delivery:
               1/min: 230
1st speed
Del.quantity cm3/: -
               1000H: 60,0
 ind.
               1/min: 330
2nd speed
Del.quantity cm3/: -
               1000H: 60,0
Shutoff electromagnet:
Cut-in
min. voltage
                     : 10,0
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
Designation
                    : 5,4...5,7
: 1,2...1,4
KF
MS
                min
                    : 4,6
: 20,2...22,2
: 9,7...13,1
SVS max.
                mm
XK
                mm
XL
                mm
Correction at adjusting nut (46)
```

Del.quantity cm3/ 1000H.: 48,2...49,2 Dispersion cm3/: 2,5 BOSCH-INJ.-PUMP TEST SPECIFICATIONS 1000H: -Note inst. in remarks column : REN 2,0 K1 Test sheet Full-load del. w/out charge press.: : 02.04.87 Edition : 10.84 1/min : 600 replaces Speed Del.quantity cm3/ Calibrating oil : ISO-4113 1000H.: 37,6...38,6 Injection pump : VE 4/9F2200 R153-1 Type number : 0 460 494 156 Low-idle speed regulation: Customer-specific information Speed 1/min: 350 Customer : RENAULT Del.quantity cm3/ 1000H.: 9,0...13,0 Engine : J 8 S-T01 cm3/: 2,5 Dispersion 1000H.: -Full-load speed regulation: TEST BENCH REQUIREMENTS Calibrating-oil oc 1/min: 2400 Speed return temp. Charge press. hPa: 800 with thermometer : 40...48 Deliquantity cm3/ : 42...50 1000H: 23,0...29,0 electronically Start: Inlet press., bar: 0.3 Calibrating nozzle-holder Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 60,0 assembly : 1 688 901 022 Opening pressure bar: 130...133 Inspection-pump test specifications Test specifications in parentheses Test inj. tubing : 1 680 750 073 Timing-device characteristic: Outside diameter : 6 x Wall thickness : 2 1st speed 1/min: 1000 mm : 450 Charge press. hPa: 800 x Length mm: 1,9...2,7 mm: (1,6...3,0) TD travel Injection-pump setting values 1/min: 1400 Test specifications in parentheses 2nd speed Charge press. hPa: 800 TD travel Timing-device travel: mm: mm: (3,5...4,9) 1/min: 1800 1/min: 1400 3rd speed Speed Charge press. hPa: 800 Charge press. hPa: 800 mm: 5,7...6,5 mm: (5,4...6,8) TD travel Setting value mm: 4,0...4,4 1/min: 2000 Supply-pump pressure: 4th speed Charge press. hPa: 800 mm: 6,2...7,0 mm: (5,9...7,3) TD travel Speed 1/min: 1400 Charge press. hPa: 800 Setting value bar: 5,1...5,7 Supply-pump pressure characteristic: Full-load del. with charge press.: 1/min: 600 1st speed Charge press. hPa: 800 1/min: 1400 Speed Supply-pump Charge press. hPa: 800

bar: 2,6...3,2

pressure

```
2nd speed
                1/min: 1800
Charge press. hPa: 800
                                                            Idle delivery:
Supply-pump
                  bar: 6,3...6,9
 pressure
                                                            1st speed
                                                                            1/min: 350
                                                            Del.quantity cm3/: -
1000H.: (7.0...15.0)
2nd speed 1/min: 375
Overflow quantity at overflow valve:
                                                            Del.quantity cm3/: 4,0...8,0
1000H.: (2,0...10,0)
1st speed
                1/min: 600
Charge press. hPa: -
Oveflow'
                      : 41...83
                                                                            1/min: 480
                                                            3rd speed
                                                            Del.quantity cm3/: -
1000H.: 0...4,0
quantity cm3/10s: (26...98)
2nd speed 1/min: 2000
Charge press. hPa: 800
Overflow : 55.
                      : 55...138
                                                            Automatic starting fuel delivery:
 quantity cm3/10s: (40...153)
                                                            1st speed
                                                                            1/min: 180
Delivery-quant. and breakaway char.:
                                                            Del.quantity cm3/: -
                                                                            1000H: 40,0
1st speed
               1/min: 700
                                                             ind.
Charge-air pressure-setting
                  hPa: 200
 point
                                                                            1/min: 300
                                                            2nd speed
LDA stroke mm: 4,5
Del.quantity cm3/: 41,5...42,5
1000H.: (39,0...45,0)
2nd speed 1/min: 2700
Charge press base 200
                                                            Del.quantity cm3/: -
                                                                            1000H: 40,0
                                                            Shutoff electromagnet:
Charge press.
                 hPa: 800
Deliquantity cm3/: -
                                                            Cut-in
               1000H.: 0...3,0
                                                                                  : 10,0
                                                             min. voltage
3rd speed
                1/min: 2500
                                                            Rated voltage
                                                                                  : 12,0
Charge press. ... -
Del.quantity cm3/: -
1000H.: 0...17,5
Charge press. hPa: 800
                                                            Mounting and assembly dimensions:
                1/min: 2400
4th speed
                                                            Designation
Charge press. hPa: 800
                                                                                  : 3,2...3,4
                                                                             mm
Del.quantity cm3/: -
1000H.: (22,0...30,0)
                                                                                  : 5,7...6.0
                                                            KF
                                                                             mm
                                                            MS
                                                                                  : 1,4...1,6
                                                                             mm
                                                                                  : 3,6
: 17,0...19,0
: 10,3...13,7
                1/min: 2000
5th speed
                                                            SVS max.
                                                                             min
Charge press. hPa: 800
                                                            ХK
                                                                             mm
Del.quantity cm3/: 44,5...46,5
1000H.: (43,2...47,8)
6th speed 1/min: 1400
                                                            XL
                                                                             mm
Charge press. hPa: 800
Deliquantity cm3/: -
                                                            Correction at adjusting nut (46)
               1000H.: (46,4...51,0)
7th speed
                1/min: 1000
Charge press. hPa: 800
Del.quantity cm3/: 46,2...49,2
1000H.: (44,9...49,3)
8th speed 1/min: 600
8th speed
Charge press. hPa:
Del.quantity cm3/: -
                1000H: (35,1...41,1)
Zero delivery (stop):
               1000H.
Electr. shutoff:
Speed
                1/min: 350
ELAB
                 volt:
Deliquantity cm3/: 3
               1000H.
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column Speed 1/min: 450 Del.quantity cm3/ 1000H.: 6,0...10,0 Test sheet : VWW 1,7 A cm3/: 2.0 1000H.: (3.0) Edition : 10.12.86 Dispersion replaces : 10.85 Calibrating oil : ISO 4113 Full-load speed regulation: Injection pump : VE 4/9F2250 R187 1/min: 2450 Speed : 0 460 494 164 Type number Del.quantity cm3/ 1000H: 12,0...18,0 Customer-specific information Start: Customer Engine : 086-1,7LIT. 1/min: 100 Speed Del.quantity mind. TEST BENCH REQUIREMENTS cm3/1000H.: 35,0 Calibrating-oil C Inspection-pump test specifications Test specifications in parentheses return temp. with thermometer : 40...48 electronically : 42...50 Timing-device characteristic: Inlet press., bar: 0.2 1st speed 1/min: 1000 mm: 2,1...2,9 mm: (1,8...3,2) Calibrating nozzle-holder TD travel : 1 688 901 000 assembly 1/min: 1500 2nd speed TD travel Opening mm: mm: (3,8...5,2) 1/min: 2250 pressure bar: 147...150 3rd speed mm: 7,4...8,2 mm: (7,1...8,5) TD travel Test inj. tubing : 1 680 750 017 Supply-pump pressure characteristic: : 6 Outside diameter x Wall thickness mm: 840 1/min: 600 x Length 1st speed Supply-pump Injection-pump setting values bar: 2,3...3,3 pressure 1/min: 2250 Test specifications in parentheses 2nd speed Supply-pump Timing-device travel: pressure bar: 6,5...7,5 Overflow quantity at overflow valve: 1/min: 1500 Setting value mm: 4,3...4,7 1/min: 600 1st speed : 55...70 Supply-pump pressure: Oveflow cm3/10s: (50...75) 1/min: 2250 quantity 1/min: 1500 2nd speed Speed : 82...112 Setting value bar: 4,8...5,4 Overflow quantity cm3/10s: (77...117) Full-load del. w/out charge press.: Delivery-quant, and breakaway char.: 1st speed 1/min: 2600 1/min : 1500 Speed Del.quantity cm3/: -Deliquantity cm3/ 1000H.: 34,5...35,5 cm3/: 2,5 1000H.: (3,0) 1000H.: 0...6,0 1/min: 2450 Dispersion 3rd speed

F22

```
Del.quantity cm3/: -
1000H.: (11,0...19,0)
4th speed
               1/min: 2400
Del.quantity cm3/: 17.0...27.0
1000H.: (16.0...28.0)
5th speed
               1/min: 2250
Del.quantity cm3/: 31.0...33.0
1000H.: (29.8...34.2)
               1/min: 1500
6th speed
Del.quantity cm3/: -
1000H.: (32,8...37,2)
               1/min: 600
7th speed
Del.quantity cm3/: 23.5...26.5
1000H.: (22.0...28.0)
Zero delivery (stop):
Mech. shutoff:
Speed
               1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
Speed
               1/min: 450
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 450
Del.quantity cm3/: -
1000H.: (4,0...12,0)
2nd speed
               1/min: 1200
Del.quantity cm3/: -
1000H.: 0...4,0
Automatic starting fuel del@very:
               1/min: 360
1st speed
Del.quantity
               cm3/: -
               1000H: 35,0
 ind.
               1/min: 560
2nd speed
Del.quantity
                cm3/: -
               1000H: 35,0
 ax.
Shutoff electromagnet:
Cut-in
 min. voltage
                     : 10,0
Rated voltage
                     : 12.0
Mounting and assembly dimensions:
Designation
                    : 3,2...3,4 : 5,7...6,0
                mm
KF
                mm
MS
                mm
                     : 1,3...1,5
SVS max.
                     : 4.8
                mm
```

Remarks:

100 March 100 Ma

2000

Note inst. in remarks column

Test sheet : FOR 1.6 A1 Edition : 3.10.86

replaces :

Calibrating oil : ISO-4113

Injection pump : VE 4/9F1800 R125-1 Type number : D 460 494 168

Type number : 0 460 494 16

Customer-specific information Customer : FORD-KENT

Engine : 1,6L IDI IND.

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Setting value mm: 5,0...5,4 KSB solenoid-operated

valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500 Setting value bar: 5,3...5,9 KSB solenoid-operated

KSB solenoid-operated valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min: 1000

Del.quantity cm3/ KSB solenoid-operated 1000H.: 27,0...28,0 volt: 12,0 valve KSB solenoid-operated 1/min: 1750 2nd speed volt: 12.0 cm3/: 2.5 valve Supply-pump bar: 5,9...6,5 Dispersion pressure 1000H.: -KSB solenoid-operated valve volt: 12,0 Low-idle speed regulation: Overflow quantity at overflow valve: Speed 1/min: 440 Del.quantity cm3/ 1000H.: 7,0...11,0 1/min: 600 1st speed KSB solenoid-operated volt: 12,0 KSB solenoid-operated valve volt: 12,0 cm3/: 2,0 : 41...83 valve Oveflow quantity cm3/10s: (26...98) Dispersion 1000H.: 2nd speed 1/min: 1750 Full-load speed regulation: KSB solenoid-operated volt: 12,0 : 55...138 Speed 1/min: 1850 Overflow Del.quantity cm3/quantity cm3/10s: (40...153) 1000H: 20,0...26,0 Delivery-quant. and breakaway char.: Start: 1st speed 1/min: 2050 KSB solenoid-operated Speed 1/min: 100 valve volt: 12,0 Del.quantity mind. Del.quantity cm3/: - 1000H.: 0...2,0 cm3/1000H.: 50,0 1/min: 1910 2nd speed KSB solenoid-operated Inspection-pump test specifications valve volt: 12.0 Del.quantity cm3/: 7.5...15.5 1000H.: (7.5...15.5) Test specifications in parentheses 1/min: 1850 Timing-device characteristic: 3rd speed KSB solenoid-operated 1/min: 800 valve volt: 12,0 1st speed Del.quantity cm3/: -1000H.: (19,0...27,0 mm: 1,6...2,4 mm: (1,3...2,7) TD travel KSB solenoid-operated 4th speed 1/min: 1750 volt: 12,0 valve KSB solenoid-operated 1/min: 1500 volt: 12,0 2nd speed valve cm3/: 29,0...31,0 1000H.: (27,8...32,2) TD travel mm: -Del.quantity mm: (4,5...5,9 1/min: 1000 KSB solenoid-operated 5th speed volt: 12,0 1/min: 1750 KSB solenoid-operated valve 3rd speed valve volt: 12,0 mm: 6,3...7,1 mm: (6,0...7,4) Del.quantity cm3/: -1000H.: (25,3...29,7) TD travel 1/min: 600 KSB solenoid-operated 6th speed KSB solenoid-operated valve volt: 12.0 4th speed 1/min: 600 volt: 12,0 valve Del.quantity cm3/: 24,0...27,0 1000H.: (22,5...28,5) mm: 2,2...4,2 TD travel mm: KSB solenoid-operated valve volt: -Zero delivery (stop): Supply-pump pressure characteristic: Mech. shutoff: 1/min: 1800 Speed Del.quantity cm3/: - 1000H. 1st speed 1/min: 600 Supply-pump bar: 3,1...3,7 pressure

F25

```
Idle delivery:
             1/min: 440
1st speed
KSB solenoid-operated
 valve
               volt: 12,0
Del.quantity cm3/: - 1000H.: (5,0...13,0)
              1/min: 475
2nd speed
KSB solenoid-operated
valve volt: 12.0
Del.quantity cm3/: 2.5...7.5
1000H.: (1.0...9.0)
3rd speed
              1/min: 570
KSB solenoid-operated
valve
               volt: 12,0
Del.quantity cm3/: -
1000H.: 0...3,5
Automatic starting fuel delivery:
1st speed
             1/min: 400
KSE solenoid-operated
               volt: 12,0
valve
Del.quantity cm3/: -
              1000H: 30,0
 ind.
              1/min: 500
2nd speed
KSB solenoid-operated
               volt: 12,0
 valve
Del.quantity cm3/: -
              1000H: 30,0
Shutoff electromagnet:
Cut-in
                   : 10,0
min. voltage
                  : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                   : 3,2-3,4
K
               mm
KF
               mm
                  1,6..1,85
3,4
23,3...25,3
MS
               min
SVS max.
               mm
XK
               mm
XL
                  : 10,4...13,8
               mm
Remarks:
```

Note inst. in remarks column

Test sheet : FIA 1,7 H3 Edition : 18.12.86 : 4.86 replaces Calibrating oil : ISO 4113

Injection pump Type number : VE 4/9F2300 R207

: 0 460 494 170

Customer-specific information : FIAT-RITMO Customer

: x8/34 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil C return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening |

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Setting value mm: 4,1...4,5

Supply-pump pressure:

1/min: 1500 Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500

Del.quantity cm3/ 1000H.: 29.5...30,5 Dispersion cm3/: 2.5 1000H.: (3,0)

1	Del.quantity cm3/: -
Low-idle speed regulation:	1000H.: 01,5 3rd speed 1/min: 2650
Speed 1/min: 390	Del.quantity cm3/: 2,09,0 1000H.: (1,59,5)
Del.quantity cm3/ 1000H.: 10,014,0	4th speed 1/min: 2450
Dispersion cm3/: 2.5 1000H.: (3,0)	Del.quantity cm3/: - 1000H.: (18,026,0)
Full-load speed regulation:	oth speed 1/min: 2300
Speed 1/min: 2450 Del.quantity cm3/	Del.quantity cm3/: 31,834,2 1000H.: (30,835,2) 6th speed 1/min: 1500
1000H: 19,025,0	Del.quantity cm3/: - 1000H.: (27,832,2)
Start:	/th speed 1/min: 1000
Speed 1/min: 100	Del.quantity cm3/: 29.832.2 1000H.: (28.733.3)
Del.quantity mind. cm3/1000H.: 55,0	8th speed 1/min: 600 Del.quantity cm3/: 30,033,0
Load-dependent start of delivery:	1000H: (28,534,5)
Speed 1/min: 1500	Zero delivery (stop):
Inspection-pump test specifications	Mech. shutoff: Speed 1/min: 2300
Test specifications in parentheses	Del.quantity cm3/: - 1900H.
Timing-device characteristic:	Isle delivery:
1st speed 1/min: 800	1st speed 1/min: 390
TD travel mm: 1,62,4 mm: (1,32,7)	Del.quantity cm3/: - 1000H.: (8,016,0)
2nd speed 1/min: 1500 I TD travel mm: - I	2nd speed
mm: (3,65,0)	1000H.: (08,0) 3rd speed 1/min: 500
TD travel mm: 7.07.8 mm: (6,78,1)	Del.quantity cm3/: - 1000H.: 01,5
Supply-pump pressure characteristic:	Automatic starting fuel delivery:
1st speed 1/min: 600	1st speed 1/min: 300
Supply-pump pressure bar: 3,13,7	Del.quantity cm3/: - ind. 1000H: 48,0
2nd speed 1/min: 2300	2nd speed 1/min: 400
Supply-pump pressure bar: 7,27,8	Del.quantity cm3/: - ax. 1000H: 45,0
Overflow quantity at overflow valve:	Shutoff electromagnet:
1st speed 1/min: 600	•
Oveflow : 4183 quantity cm3/10s: (2698)	Cut-in min. voltage : 10,0
2nd speed 1/min: 2300	Rated voltage : 12,0
Overflow : 55138 quantity cm3/10s: (40153)	Mounting and assembly dimensions:
Delivery-quant. and breakaway char.:	Designation K mm : 3,23,4
F28	

KF mm : 5,7...5,9 MS mm : 1,7...1,9 SVS max. mm : 2,8

Remarks:

Note inst. in remarks column

Test sheet : VWW 1.6 X2 Edition : 02.04.87 replaces : 4.86 Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R211 Type number : 0 460 494 172

Customer-specific information

Customer : VW

Engine : 086-1,6LIT.LLK

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

pressure bar : 147...150

Test inj. tubing : 1 680 750 000

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 750 Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 750 Setting value bar: 4,9...5,5

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 750 Del.quantity cm3/ 1000H.: 41,5...42,5 cm3/: 2,5 1/min: 500 1st speed Charge press. hPa: 750 Dispersion 1000H : -Supply-pump bar: 2,0...2,6 1/min: 2250 hPa: 750 pressure Full-load del. w/out charge press.: 2nd speed Charge press. Speed 1/min : 1500 Supply-pump Del.quantity cm3/ pressure bar: 7,0...7,6 1000H.: 34,3...37,3 Overflow quantity at overflow valve: Low-idle speed regulation: 1/min: 600 1st speed Charge press. hPa: 1/min: 375 Speed 55...70 Charge press. hPa: -Oveflow' quantity cm3/10s: (50...75 Deliquantity cm3/ 1000H.: 12,0...14,0 1/min: 2250 2nd speed Charge press. hPa: 750 cm3/: 2,5 Dispersion : 82...112 1000H.: -Overflow quantity cm3/10s: (77...117) Residual-Delivery Setting Speed 1/min: 550 Del.quantity cm3/ 1000H.: 2,5...3,5 Delivery-quant. and breakaway char.: 1st speed 1/min: 900 Full-load speed regulation: Charge-air pressure-setting point hPa: 300 LDA stroke mm: 6.0 Del.quantity cm3/: 32.5...33.5 1000H.: (30.0...36.0 LDA stroke 1/min: 2525 Speed Charge press. hPa: 750 Deliquantity cm3/ 1000H: 13,0...19,0 1/min: 2700 2nd speed Charge press. hPa: 750 Del.quantity cm3/: -1000H.: 0...4,0 Start: 1/min: 2525 Speed 1/min: 100 3rd speed Del.quantity mind. Charge press. hPa: 750 Del.quantity cm3/: -1000H.: (12,0...20,0) 4th speed 1/min: 2425 cm3/1000H.: 35,0 Inspection-pump test specifications Charge press. hPa: 750
Del.quantity cm3/: 25,0...35,0
1000H.: (24,0...36,0)
Sth speed 1/min: 2250 Test specifications in parentheses Timing-device characteristic: Charge press. hPa: 750 Del.quantity cm3/: 35.5...37.5 1000H.: (34.3...38.7) 1/min: 1000 1st speed Charge press. hPa: 750 1/min: 1500 TD travel mm: 1,8...2,6 6th speed mm: (1,5...2,9)Charge press. hPa: -Del.quantity cm3/: 1000H.: (33,6...38,0)
7th speed 1/min: 1500 2nd speed 1/min: 1500 Charge press. hPa: 750 mm: (3,3...4,3) TD travel Charge press. hPa: 750 Del.quantity cm3/: 1000H.: (39,8...44,2) 1/min: 1800 3rd speed Charge press. hPa: 750 mm: 4,8...5,6 mm: (4,5...5,9) 1/min: 2250 1/min: 500 TD travel 8th speed Charge press. hPa: Del.quantity cm3/: 23,5...24,5 1000H: (21,0...27,0) 4th speed Charge press. hPa: 750 1/min: 500 TD travel mm: 6,1...6,9 mm: (5,8...7,2) 9th speed Charge press. hPa: 750 Del.quantity cm3/: 31,0...34,0 1000H: (19,5...35,5) Supply-pump pressure characteristic:

G03

```
Zero delivery (stop):
Mech. shutoff:
               1/min: -
Speed
Del.quantity cm3/: - 1000H.
Electr. shutoff:
                1/min: 425
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 375
Del.quantity cm3/: -
1000H.: (7,5...18,5)
2nd speed 1/min: 425
Del.quantity cm3/: 5.0...9.0
1000H.: (1,5...12,5)
High Idle:
Speed 1/min: 525
Del.quantity cm3/: 7.0...9.0
1000H.: (3,0...13,0)
Residual:
Speed 1/min: 500
Del.quantity: 2,7...4,7
1000H.: (0,2...7,2)
Automatic starting fuel delivery:
1st speed
                1/min: 150
Del.quantity cm3/: -
                1000H: 35,0
 ind.
2nd speed
               1/min: 350
Del.quantity cm3/: -
                1000H: 30,0
Shutoff electromagnet:
Cut-in
                      : 10,0
 min. voltage
                      : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                 mm
                      : K1
                     : 5,7...6,0
KF
                 mm
                      : 1,2...1,4
MS
                 mm
SVS max.
                 mm
Setting of residual delivery.
```

Del.quantity cm3/ 1000H.: 41,5...42,5 cm3/: 2,5 BOSCH-INJ.-PUMP TEST SPECIFICATIONS Dispersion 1000H.: (3.0) Note inst. in remarks column Low-idle speed regulation: : SOF 2,5 M Test sheet Edition : 15.12.86 replaces : 6.86 Speed 1/min: 400 Del.quantity cm3/ 1000H.: 11.0...15.0 Dispersion...... cm3/: 2.5 1000H.: (3.0) : ISO 4113 Calibrating oil : VE 4/9F2100 R214 Injection pump Type number : 0 460 494 173 Full-load speed regulation: Customer-specific information :****1/min: 2410 Customer : SOFIM Speed Del.quantity cm3/ 1000H: 19,0...25,0 : 8144.67.2000 Engine TEST BENCH REQUIREMENTS Start: Calibrating-oil oc 1/min: 100 Speed Del.quantity mind. return temp. £111111114 with thermometer : 40...48 1 cm3/1000H.: 60.0 electronically : 42...50 Load-dependent start of delivery: Inlet press., bar: 0.2 1/min: 1100 Speed Calibrating nozzle-holder : 1 688 901 022 assembly Inspection-pump test specifications Test specifications in parentheses Opening pressure bar: 130...133 Timing-device characteristic: Test inj. tubing : 1 680 750 073 1st speed 1/min: 700 mm: 0.8...1.6 mm: (0.5...1.9) TD travel : 6 Outside diameter 1/min: 1100 x Wall thickness : 2 2nd speed mm : 450 TD travel x Length mm: mm: (3,0...4,4) 1/min: 2000 Start of delivery 3rd speed mm: 8,6...9,4 mm: (8,3...9,7) mm : 0.3 TD travel Prestroke (from BDC): +-0.02(0.04)Injection-pump setting values Supply-pump pressure characteristic: Test specifications in parentheses 1/min: 700 1st speed Timing-device travel: Supply-pump bar: 3,5...4,1 pressure 1/min: 2000 1/min: 1100 2nd speed Setting value mm: 3,5...3,9 Supply-pump pressure bar: 7,0...7,6 Supply-pump pressure: Overflow quantity at overflow valve: 1/min: 1100 1/min: 600 Setting value bar: 4,7...5,3 1st speed : 41...83 Oveflow cm3/10s: (26...98) Full-load del. w/out charge press.: quantity 1/min: 2100 2nd speed Speed 1/min: 1100

G05

Over flow : 55...138 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2610 Del.quantity cm3/: -1000H.: 0...3,0 1/min: 2510 3rd speed Del.quantity cm3/: 6.5...13.5 1000H.: (6.0...14.0) 4th speed 1/min: 2410 Del.quantity cm3/: 1000H.: (18,0...26,0) 1/min: 2100 5th speed Del.quantity cm3/: 41,9...44,9 1000H.: (41,2...45,6) 1/min: 2000 6th speed Del.quantity cm3/: 42.0...45.0 1000H.: (41.3...45.7) 7th speed 1/min: 1100 7th speed Del.quantity cm3/: -1000H.: (39,8...44,2) 1/min: 600 8th speed Del.quantity cm3/: 36,0...39,0 1000H: (34,5...40,5) Zero delivery (stop): Mech. shutoff: -Speed 1/min: -Del.quantity cm3/: -1000H. Electr. shutoff: Speed 1/min: 2100 ELAB ELAB Del.quantity cms/ 1000H. volt: cm3/: -Idle delivery: 1st speed 1/min: 400 Del.quantity cm3/: -1000H.: (9,0...17,0) 1/min: 450 2nd speed Del.quantity cm3/: 2.0...8.0 1000H.: (1.0...9.0) 3rd speed 1/min: 700 Del.quantity cm3/: 1.5...7.5 1000H.: (0.5...8,5) 1/min: 1000 4th speed cm3/: -Del.quantity 1000H.: 0...2,5 Automatic starting fuel delivery: 1st speed 1/min: 250 Deliquantity cm3/: -

1000H: 55,0

2nd speed 1/min: 400 Del.quantity cm3/: ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

mm : -

KF mm : 5,2...5,5 MS mm : 1,7...1,9 SVS max. mm : 4,3

Remarks:

ind.

Note inst. in remarks column

Test sheet : PEU 2.5 D
Edition : 3.10.86
replaces : 9.85
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2125 R126-3 Type number : 0 460 494 178

Customer-specific information Customer : PEUGEOT

Engine : XD 3T

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 800

Deliquantity cm3/ 1/min: 750 2nd speed 1000H.: 53.5...54,5 cm3/: 2,5 hPa: 800 Charge press. Supply-pump Dispersion 1000H : bar: 3,4...4,0 pressure 1/min: 2000 3rd speed Full-load del. w/out charge press.: Charge press. hPa: 800 Supply-pump Speed 1/min : 500 bar: 7,1...7,7 pressure Del.quantity cm3/ 1000H.: 40,0...41,00 Overflow quantity at overflow valve: 1st speed Low-idle speed regulation: 1/min: 500 Charge press. hPa: -Oveflow | Speed 1/min: 400 Del.quantity cm3/ 1000H.: 17,0...21,0 quantity cm3/10s: (26...98) 2nd speed 1/min: 2125 Dispersion cm3/: 2,0 Charge press. hPa: -1000H.: -Overflow quantity cm3/10s: (40...153) Full-load speed regulation: Speed 1/min: 2350 Delivery-quant. and breakaway char.: Charge press. hPa: 800 1/min: 750 1st speed Del.quantity cm3/ Charge-air pressure-setting hPa: 300 1000H: 26,5...32,5 point LDA stroke mm: 4,5
Del.quantity cm3/: 47,5...48,5
1000H.: (45,8...50,2) Start: 1/min: 2650 Speed 1/min: 100 2nd speed Del.quantity mind. Charge press. hPa: 800 cm3/1000H.: 67.0 Inspection-pump test specifications Test specifications in parentheses Charge press. hPa: 800 Del.quantity cm3/: 26.5...32.5 1000H.: (25.5...33.5) 1/min: 2250 Timing-device characteristic: 4th speed Charge press. hPa: 800
Del.quantity cm3/: 38.5...44.5
1000H.: (37.5...45.5) 1st speed 1/min: 750 Charge press. hPa: 800 1/min: 2000 TD travel mm: 0,8...1,6 5th speed mm: (0,5...1,9) Charge press. hPa: BOO Del.quantity cm3/: 52,0...54,0 1000H.: (50,8...55,2) 1/min: 1000 2nd speed Charge press. hPa: 800 mm: 2,5...3,3 mm: (2,2...3,6) 1/min: 1500 1/min: 1500 TD travel 6th speed Charge press. hPa: 800 Del.quantity cm3/: 1000H.: (51,8...56,2)
7th speed 1/min: 1000 3rd speed Charge press. hPa: 800 TD travel mm: · mm: (5,3...6,7) Charge press. hPa: 800 Del.quantity cm3/: 50.5...53.5 1000H.: (49.8...54.2) 1/min: 2000 4th speed Charge press. hPa: 800 1/min: 750 mm: 7,8...8,6 mm: (7,5...8,9) TD travel 8th speed Charge press. hPa: Del.quantity cm3/: 41.5...44.5 1000H: (40.8...45.2) Supply-pump pressure characteristic: 1/min: 500 9th speed Charge press. hPa: -1st speed 1/min: 200 Deliquantity cm3/: hPa: 800 Charge press. 1000H: (38,3...42,7) Supply-pump bar: 1,4...2,0 pressure **G08**

```
Zero delivery (stop):
Mech. shutoff:
                1/min: 2125
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
                1/min: 400
Del.quantity cm3/: -
1000H.: (15,0...23,0
2nd speed  1/min: 450
Del.quantity cm3/: 5,0...9,0
1000H.: (3,0...11,0)
3rd speed  1/min: 550
Del.quantity cm3/: -
1000H.: 0...3,5
Automatic starting fuel delivery:
                1/min: 230
1st speed
Del.quantity cm3/: -
 ind.
                1000H: 60,0
2nd speed
                1/min: 330
Del.quantity cm3/: -
                1000H: 60.0
 ax.
Shutoff electromagnet:
Cut-in
                       : 10,0
 min. voltage
Rated voltage
                       : 12,0
Mounting and assembly dimensions:
Designation
K
                       : K1
                  M.A
                      : 5,2...5,4
KF
                  mm
                       : 1,2...1,4
MS
                  mm
                       : 5,5
SVS max.
                  mm
                       : 20,2...22,2
: 9,4...12,8
XK
                  mm
XL
                  mm
Correction at adjusting nut (46)
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Speed Note inst. in remarks column 1/min: 375 Del.quantity cm3/ 1000H.: 12,0...14,0 : VWW1_6 W17 Test sheet Edition cm3/: 2,0 : 8.12.86 Dispersion : 12.85 replaces 1000H.: (3,0) : ISO 4113 Residual-Delivery Setting Calibrating oil 1/min: 550 Speed Del.quantity cm3/ 1000H.: 2,5...3,5 Injection pump : VE 4/9F2400 R221 Type number : 0 460 494 179 Full-load speed regulation: Customer-specific information Customer 1/min: 2600 Speed Deliquantity cm3/ : 086-1.6 LIT. 1000H: 11,0...17,0 Engine TEST BENCH REQUIREMENTS Start: Calibrating-oil oC Speed 1/min: 100 return temp. Del.quantity mind. with thermometer : 40...48 cm3/1000H.: 35.0 electronically : 42...50 Load-dependent start of delivery: Inlet press., bar: 0.2 Speed 1/min: 1250 Calibrating nozzle-holder : 1 688 901 000 assembly Inspection-pump test specifications Test specifications in parentheses Opening. bar: 147...150 pressure Timing-device characteristic: Test inj. tubing : 1 680 750 017 1/min: 1000 1st speed mm: 1.0...1.8 mm: (0.7...2.1) 1/min: 1250 TD travel Outside diameter x Wall thickness 2nd speed mm : 840 x Length TD travel mm: mm: (1,6...3,0)1/min: 1800 3rd speed Injection-pump setting values mm: 4,2...5,0 mm: (3,9...5,3) Test specifications in parentheses TD travel 1/min: 2400 Timing-device travel: 4th speed mm: 6,1...6,9 mm: (5,8...7,2) TD travel 1/min: 1250 Speed Setting value mm: 2,1...2,5 Supply-pump pressure characteristic: Supply-pump pressure: 1/min: 600 1st speed Supply-pump Speed 1/min: 1250 Setting value bar: 4,0...4,6 bar: 2,1...2,7 pressure 1/min: 2400 2nd speed Full-load del. w/out charge press.: Supply-pump bar: 7,3...7.9 pressure 1/min : 1500 Speed Overflow quantity at overflow valve: Deliquantity cm3/ 1000H.: 31.5...32,5 cm3/: 2.5 1000H.: (3,0) 1st speed 1/min: 600 Dispersion

G10

```
veflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 2400
Oveflow
2nd speed
Over flow
                     : 55...138
 quantity cm3/10s: (40...153)
Delivery-quant. and breakaway char.:
1st speed
               1/min: 2800
Del.quantity cm3/: -
1000H.: 0...4,0
                1/min: 2600
3rd speed
Del.quantity cm3/: -
1000H.: (10,0...18,0)
                1/min: 2500
4th speed
Del.quantity cm3/: 19.0..29.0
1000H.: (20.0..28.0)
                1/min: 2400
5th speed
Del.quantity cm3/: 26.7...28.7
1000H.: (25.5...30.1)
6th speed 1/min: 1500
Del.quantity cm3/: -
1000H.: (29,7...34,3)
                1/min: 600
7th speed
Del.quantity cm3/: 20,2...23,2
              1000H.: (18,7...24,7)
Zero delivery (stop):
Mech. shutoff:
Speed
                1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
Speed
               1/min: 400
Del.quantity cm3/: - 1000H.
Idle delivery:
                1/min: 375
1st speed
Del.quantity cm3/: -
              1000H.: (9,0...17,0)
1/min: 425
2nd speed
Del.quantity cm3/: 5.5...8.5
1000H.: (3.0...11.0)
High Idle:
                1/min: 525
Speed
Del.quantity cm3/: 7,0...9,0
1000H.: -
Residual:
                1/min: 500
Speed
Del.quantity . . . 1000H.: -
                 5,...4,5
Automatic starting fuel delivery:
1st speed
               1/min: 200
```

```
Del_quantity cr3/: -
               1000H: 35.0
 ind.
              1/min: 350
2nd speed
Del.quantity cm3/: -
               1000H: 30,0
Shutoff electromagnet:
Cut-in
                    : 10,0
min. voltage
                    : 12,0
Rated voltage
Mounting and assembly dimensions:
Designation
                      3,2...3,4
5,7...6,0
1,3...1,5
17,0...19,0
                mm
KF
                mm
MS
                mm
XK
                mm
XL
                      9.8...13,2
                mm
Setting of residual delivery.
 emarks:
```

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column Speed 1/min: 375 Del.quantity cm3/ 1000H.: 12,0...14,0 : VWW 1.6 W15 Test sheet : 8.12.86 Edition cm3/: 2,0 Dispersion 1000H.: (3,0) replaces : 12.85 : ISO 4113 Residual-Delivery Setting Speed 1/min: 550 Calibrating oil Del.quantity cm3/ 1000H.: 2,5...3,5 : VE 4/9F2400 R224 Injection pump : 0 460 494 185 Type number Full-load speed regulation: Customer-specific information Customer 1/min: 2600 Speed Del.quantity cm3/ Engine : 086-1,6 LIT. 1000H: 11,0...17,0 TEST BENCH REQUIREMENTS Start: Calibrating-oil C Speed 1/min: 100 return temp. Del.quantity mind. cm3/1000H.: 35.0 with thermometer : 40...48 : 42...50 electronically Load-dependent start of delivery: Inlet press., bar : 0.2 Speed 1/min: 1250 Calibrating nozzle-holder : 1 688 901 000 assembly Inspection-pump test specifications Test specifications in parentheses Opening. bar: 147...150 pressure Timing-device characteristic: Test inj. tubing : 1 680 750 017 1st speed 1/min: 1000 mm: 1,0...1.8 mm: (0,7...2,1 1/min: 1250 TD travel Outside diameter 2nd speed x Wall thickness mm: 840 TD travel mm: x Length mm: (1,6...3,0)1/min: 1800 Injection-pump setting values 3rd speed mm: 4,2...5,0 mm: (3,9...5,3) Test specifications in parentheses TD travel 1/min: 2400 Timing-device travel: 4th speed TD travel mm: 6,1...6,9 mm: (5,8...7,2) 1/min: 1250 Speed Setting value mm: 2,1...2,5 Supply-pump pressure characteristic: Supply-pump pressure: 1st speed 1/min: 600 Speed 1/min: 1250 Supply-pump bar: 2,1...2,7 Setting value bar: 4,0...4,6 pressure 1/min: 2400 2nd speed Full-load del. w/out charge press.: Supply-pump bar: 7,3...7,9 pressure Speed 1/min : 1500 Overflow quantity at overflow valve: Del.quantity cm3/ 1000H.: 31.5...32,5 cm3/: 2.5 1000H.: (3,0) 1/min: 600 1st speed Dispersion

G12

```
Oveflow
                      : 41...83
 quantity cm3/10s: (26...98)
                1/min: 2400
2nd speed
                     : 55...138
Over flow
 quantity cm3/10s: (40...153)
Delivery-quant. and breakaway char.:
               1/min: 2800
1st speed
Del.quantity cm3/: -
1000H.: 0...4,0
                1/min: 2600
3rd speed
Del.quantity cm3/: -
1000H.: (10,0...18,0)
                1/min: 2500
4th speed
Del.quantity cm3/: 19.0...29.0
1000H.: (20.0...28.0)
                1/min: 2400
5th speed
Del.quantity cm3/: 26.7...28.7
1000H.: (25.5...30.1)
6th speed 1/min: 1500
6th speed
Del.quantity cm3/: -
1000H.: (29,7...34,3)
                1/min: 600
7th speed
Del.quantity cm3/: 20,2...23,2
1000H.: (19,4...24,0)
Zero delivery (stop):
Mech. shutoff:
Speed
                1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 400
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
               1/min: 375
1st speed
Del.quantity cm3/: -
              1000H.: (9,0...17,0
                1/min: 425
2nd speed
Del.quantity cm3/: 5,5...8,5
1000H.: (3,0...11,0)
High Idle:
Speed 1/min: 525
Del.quantity cm3/: 7,0...9,0
1000H.: -
Residual:
                1/min: 500
Speed
Del.quantity
                    5,...4,5 :
              1000H.:
Automatic starting fuel delivery:
1st speed
               1/min: 200
```

Del.quantity cm3/: ind. 1000H: 35,0

2nd speed 1/min: 350
Del.quantity cm3/: 1000H: 30,0

Shutoff electromagnet:

Cut-in

Cut-in min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation 3,2...3,4 mm : 5,7...6,0 : 1,3...1,5 : 3,2 : 17,0...19,0 KF mm MS mm SVS max. mm ΧK mm : 9,8...13,2 mm Setting of residual delivery. emarks:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : FOR 1_6 A2 Edition : 3.10.86 replaces Calibrating oil : ISO-4113 : VE 4/9F2400 R125-2 Injection pump Type number : 0 460 494 186 Customer-specific information Customer : FORD-KENT Engine : 1.6L. IDI IND. TEST BENCH REQUIREMENTS Calibrating-oil C return temp. with thermometer : 40...48 : 42...50 electronically Inlet press., bar: 0.2 Calibrating nozzle-holder assembly : 1 688 901 022 Opening bar: 130...133 pressure Test inj. tubing : 1 680 750 073 Outside diameter x Wall thickness : 2 mm: 450 x Length Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1500 Speed Setting value mm: 4,3...4,7 KSB solenoid-operated valve volt: 12,0 Supply-pump pressure: Speed 1/min: 1500 Setting value bar: 5,3...5,9

KSB solenoid-operated volt: 12,0 valve Full-load del. w/out charge press.: 1/min : 1750 Speed

Del.quantity cm3/ 1000H.: 29,5...30,5 KSB solenoid-operated valve volt: 12,0 cm3/: 2,5 Dispersion 1000H.: -Low-idle speed regulation: Speed 1/min: 440 Del.quantity cm3/ 1000H.: 7,0...11,0 KSB solenoid-operated valve volt: 12,0 cm3/: 2,0 Dispersion 1000H .: -Full-load speed regulation: 1/min: 2675 Speed Deliquantity cm3/ 1000H: 7,5...13,5 KSB solenoid-operated valve volt: 12.0 Start: Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 50,0 KSB solenoid-operated valve volt: 12,0 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 1000 1st speed mm: 1,3...2,1 TD travel KSB solenoid-operated volt: 12,0 valve 1/min: 1500 2nd speed TD travel mm: mm: (3,8...5,2) KSB solenoid-operated volt: 12.0 1/min: 2000 valve 3rd speed mm: 6,8...7,6 TD travel mm: (6,5...7,9)KSB solenoid-operated volt: 12,0 valve 1/min: 600 4th speed mm: 2,2...4,2 TD travel mm: -KSB solenoid-operated volt: valve Supply-pump pressure characteristic:

```
1st speed
               1/min: 600
Supply-pump
                                                        Zero delivery (stop):
                 bar: 3,0...3,6
 pressure
KSB solenoid-operated
                                                        Mech. shutoff:
                volt: 12,0
 valve
                                                        Speed
                                                                      1/min: 2400
2nd speed
               1/min: 2000
                                                        Del.quantity cm3/: -
Supply-pump
                                                                      1000H.
 pressure
                 bar: 6,6...7,2
KSB solenoid-operated
                                                        Idle delivery:
 valve
                volt: 12.0
                                                        1st speed
                                                                       1/min: 440
Overflow quantity at overflow valve:
                                                        KSB solenoid-operated
                                                                        volt: 12,0
                                                         valve
                                                        Del.quantity cm3/: -
1000H.: (5,0...13,0)
1st speed
               1/min: 600
KSB solenoid-operated
                volt: 12,0
                                                                       1/min: 475
 valve
                                                        2nd speed
                     : 41...8,3
Oveflow
                                                        KSB solenoid-operated
                                                        valve volt: 12.0
Del.quantity cm3/: 2.5...7.5
1000H.: (1.0...9.0)
 quantity cm3/10s: (26...98)
              1/min: 2400
2nd speed
KSB solenoid-operated
                volt: 12.0
: 55...138
                                                        3rd speed
 valve
                                                                       1/min: 570
Overflow
                                                        KSB solenoid-operated
 quantity cm3/10s: (40...153)
                                                         valve
                                                                        volt: 12,0
                                                        Del.quantity cm3/: -
                                                                      1000H.: 0...3,5
Delivery-quant. and breakaway char.:
1st speed
              1/min: 2950
KSB solenoid-operated
                                                        Arrangement of drivers on engine-
                                                        speed lever for exhaust-gas-
                volt: 12,0
 valve
Del.quantity cm3/: -
1000H.: 0...2,0
                                                        recirculation valve linkage (guage)
               1/min: 2675
                                                                       1/min: 1100
2nd speed
                                                        1st speed
                                                        KSB solenoid-operated
KSB solenoid-operated
                                                                        volt: 12,0
 valve
                volt: 12,0
Del.quantity cm3/: -
1000H.: (6,5...14,5)
3rd spec 2 1/min: 2550
                                                        Del.quantity cm3/: 12,0..13,0
                                                                      1000H.: -
KSB solenoid-operated
                                                        Automatic starting fuel delivery:
                volt: 12,0
 valve
Del.quantity cm3/: 18.5...26.5
1000H.: (18.5...26.5)
                                                                       1/min: 400
                                                        1st speed
                                                        KSB solenoid-operated
               1/min: 2400
                                                                        volt: 12,0
4th speed
                                                         valve
                                                        Del.quantity cm3/: -
KSB solenoid-operated
valve volt: 12.0
Del.quantity cm3/: 28.1...30.1
1000H.: (26.9...31.3)
                                                                       1000H: 30,0
                                                         ind.
                                                        2nd speed
                                                                       1/min: 500
               1/min: 1750
                                                        KSB solenoid-operated
5th speed
                                                                        volt: 12,0
KSB solenoid-operated
                                                         valve
                                                        Del.quantity
 valve
                volt: 12,0
                                                                        cm3/: -
Del.quantity cm3/: -
1000H.: (27,8...32,2)
                                                                       1000H: 30,0
               1/min: 1000
6th speed
                                                        Shutoff electromagnet:
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 26,0...29,0
1000H.: (25,3...29,7)
                                                        Cut-in
                                                                            : 10,0
                                                         min. voltage
                                                        Rated voltage
                                                                             : 12,0
               1/min: 600
7th speed
                                                        Mounting and assembly dimensions:
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 24,0...27,0
1000H.: (22,5...28,5)
                                                        Designation
                                                                        mm : 3,2-3,4
```

KF MS mm : 5,7-6,0 mm : 1,6-1,85

Del.quantity cm3/ 1000H.: 47.5...48,5 Dispersion cm3/: 2,5 BOSCH-INJ.-PUMP TEST SPECIFICATIONS 1000H : (3,0) Note inst. in remarks column Test sheet : FIA 1,7 P Full-load del. w/out charge press.: Edition : 18.12.86 1/min : 800 replaces Speed Del.quantity cm3/ 1000H.: 34,8...35,8 Calibrating oil : ISO 4113 Injection pump : Ve 4/9F2100 R234 Type number : 0 460 494 187 Low-idle speed regulation: Customer-specific information 1/min: 350 : FIAT REGATA Customer Charge press. hPa: -Del.quantity cm3/ 1000H.: 16,0...20,0 Engine : x8/45 cm3/: 2,5 1000H.: (3,0) 4111116 Dispersion TEST BENCH REQUIREMENTS Full-load speed regulation: Calibrating-oil return temp. °C 1/min: 2400 Speed Charge press. hPa: 1000 with thermometer : 40...48 Del.quantity cm3/ 1000H: 15,0...21,0 electronically : 42...50 Inlet press., bar: 0.2 Start: Calibrating nozzle-holder : 1 688 901 022 assembly Speed 1/min: 100 Deliquantity mind. Opening cm3/1000H.: 57,0 pressure bar : 130...133 Load-dependent start of delivery: Test inj. tubing : 1 680 750 073 1/min: 1500 Speed Charge press. hPa: -Qutside diameter : 6 x Wall thickness : 2 Inspection-pump test specifications mm : 450 Test specifications in parentheses x Length Injection-pump setting values Test specifications in parentheses Timing-device characteristic: Timing-device travel: 1st speed 1/min: 800 Charge press. hPa: 1000 TD travel mm: 1,0...1,8 Speed 1/min: 1500 Charge press. hPa: 1000 mm: (0,7...2,1)Setting value mm: 4,9...5,3 2nd speed 1/min: 1500 Charge press. hPa: 1000 TD travel Supply-pump pressure: mm: mm: (4,4...5,8)1/min: 1500 3rd speed 1/min: 2000 Charge press. hPa: 1000 Setting value bar: 5,6...6,2 Charge press. hPa: 1000 TD travel mm: 7.4...8.2 mm: (7,1...8,5) Full-load del. with charge press.: Supply-pump pressure characteristic: 1/min: 1500 Speed Charge press. hPa: 1000 1st speed 1/min: 400 Charge press. hPa: 1000

Supply-pump bar: 2,2...2,8 1/min: 800 pressure Zero delivery (stop): 2nd speed Charge press. hPa: 1000 Mech. shutoff: 1/min: 2100 Speed Supply-pump bar: 3,5...4,1 Del.quantity cm3/: pressure 1000H. 3rd speed 1/min: 2000 Charge press. hPa: 1000 Supply-pump Idle delivery: bar: 7,0...7,6 pressure 1/min: 350 1st speed Del.quantity cm3/: -1000H.: (14,0..22,0) Overflow quantity at overflow valve: 1/min: 400 1st speed 1/min: 600 2nd speed Del.quantity cm3/: 4,5...10,5 1000H.: (3,5...11,5) Charge press. hPa: -Oveflow : 41...83 1/min: 500 quantity cm3/10s: (26...98) 3rd speed 2nd speed 1/min: 2100 Del.quantity cm3/: -Charge press. hPa: 1000 Overflow: 55... 1000H.: 0...3,0 : 55...138 quantity cm3/10s: (40...153) Automatic starting fuel delivery: 1st speed 1/min: 300 Delivery-quant. and breakaway char.: 1st speed Del.quantity cm3/: -1/min: 800 1000H: 55,0 Charge-air pressure-setting ind. hPa: 300 point Del.quantity cm3/: 39,5...40,5 1000H.: (37,8...40,2) 2nd speed 1/min: 2550 2nd speed 1/min: 500 Del.quantity cm3/: -1000H: 40,0 Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...7,0 Shutoff electromagnet: 3rd speed 1/min: 2400 Cut-in : 10,0 Charge press. hPa: 1000 min. voltage Del.quantity cm3/: -1000H.: (14,0...22,0) 4th speed 1/min: 2300 Rated voltage : 12,0 Mounting and assembly dimensions: Charge press. hPa: 1000 Del.quantity cm3/: 25.5...32.5 1000H.: (25.0...33.0) Designation : 3,2...3,4 : 5,7...6,0 mm 1/min: 2100 **KF** mm 5th speed Charge press. hPa: 1000 Del.quantity cm3/: 46.5...49.5 1000H.: (45.8...50.2) : 1,4..1,65 MS mm SVS max. mm : 17,0...19,0 XK mm 1/min: 1500 XL mm 0,14,...6 : 6th speed Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: (45,8...50,2) Correction at adjusting nut (46) 1/min: 800 7th speed Charge press. hPa: 1000 Del.quantity cm3/: 49.5...52.5 1000H.: (48.8...53.2) 1/min: 800 8th speed Charge press. hPa: cm3/: -Deliquantity 1000H: (33,1...37,5) 1/min: 600 9th speed Charge press. hPa: Del.quantity cm3/: 34,6...37,0 1000H: (32,8...38,8)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column Speed 1/min: 375 Del.quantity cm3/ 1000H.: 8,5...10,5 Test sheet : PEU 1,9 F cm3/: 2,0 1000H.: (3,0) Edition : 16.12.86 Dispersion replaces Calibrating oil : ISO 4113 Residual-Delivery Setting Speed 1/min: 550 Del.quantity cm3/ 1000H.: 2,5...3,5 Injection pump : VE 4/9F2300 R237 : 0 460 494 188 Type number Full-load speed regulation: Customer-specific information Customer : PEUGEOT 1/min: 2400 Speed Del.quantity cm3/ : XUD 9 Engine 1000H: 20,0...26,0 TEST BENCH REQUIREMENTS Start: Calibrating-oil oC Speed 1/min: 100 Del.quantity mind. return temp. with thermometer : 40...48 cm3/1000H.: 44,0 electronically : 42...50 Load-dependent start of delivery: Inlet press., bar : 0.2 Speed 1/min: 1250 Calibrating nozzle-holder Inspection-pump test specifications Test specifications in parentheses : 1 688 901 022 assembly Opening bar: 130...133 pressure Timing-device characteristic: $g(\theta)$ 1st speed Test inj. tubing : 1 680 750 073 1/min: 700 TD travel mm: 0,9...1,7 mm: (0,6...2,0)Outside diameter : 6 x Wall thickness : 2 1/min: 1250 2nd speed x Length mm: 450 TD travel mm: mm: (2,7...4,1)1/min: 2000 Injection-pump setting values 3rd speed mm: 6,4...7,2 mm: (6,1...7,5) Test specifications in parentheses TD travel Timing-device travel: Supply-pump pressure characteristic: Speed 1/min: 1250 Setting value mm: 3,2...3,6 1st speed 1/min: 700 Supply-pump bar: 2,5...3,1 Supply-pump pressure: pressure 1/min: 2000 2nd speed Speed 1/min: 1250 Supply-pump Setting value bar: 3,9...4,5 pressure bar: 5,7...6,3 Full-load del. w/out charge press.: Overflow quantity at overflow valve: 1/min: 700 1/min : 1250 Speed 1st speed Del.quantity cm3/ Oveflow | : 41...83 1000H.: 30,0...31,0 cm3/10s: (26...98) quantity cm3/: 2,5 1000H.: (3,0) 2nd speed 1/min: 2300 Dispersion

G19

: 55..138 Overflow quantity cm3/10s: (40...153) Delivery-guant. and breakaway char.: 1st speed 1/min: 2650 Del.quantity cm3/: -1000H.: 0...7,0 1/min: 2500 3rd speed Del.quantity cm3/: 10,0...16,0 1000H.: (9,0...17,0) 4th speed 1/min: 2400 Del.quantity cm3/: -1000H.: (19,0...27,0) 1/min: 2250 5th speed Del.quantity cm3/: 30,5...32,5 1000H.: (29,3...33,7) 1/min: 2000 6th speed Del.quantity cm3/: 32,0...34,0 1000H.: (30,8...35,2) 7th speed 1/min: 1250 Del.quantity cm3/: -1000H.: (28,3...32,7) Ath speed 1/min: 700 Del.quantity cm3/: 30,0...33,0 1000H: (28,5...34,5) Zero delivery (stop): Mech. shutoff: Speed 1/min: 2300 Del.quantity cm3/: -1000H. Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: -1000H.: (5,5...13,5) High Idle: 1/min: 470 Speed Del.quantity cm3/: 8,0...10,0 1000H.: (5,0...13,0) Residual: 1/min: 550 Speed Del.quantity 1000H.: 0...7,0 Arrangement of drivers on enginespeed lever for exhaust-gasrecirculation valve linkage (guage) 1st speed 1/min: 1125 Del.quantity cm3/: 18,0..20,0 1000H.: -Automatic starting fuel delivery: 1st speed 1/min: 200

Del.quantity cm3/: -1000H: 40,0 ind. 1/min: 300 2nd speed Del.quantity cm3/: -1000H: 35,0 Shutoff electromagnet: Cut-in : 10,0 min. voltage Rated voltage : 12,0 Mounting and assembly dimensions: Designation : 3,2...3,4 mm

mm

: 1,3..1,55 MS mm SVS max. mm

Remarks:

KF

Note inst. in remarks column

Test sheet : SOF 2.5 N Edition : 19.12.86 replaces : 4.86 Calibrating oil : ISO 4113

Injection pump : VE 4/9F2100 R22-7 Type number : 0 460 494 189

Customer-specific information Customer : SOFIM

: 8144.67.220 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening -

pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840 x Length

Start of delivery

Prestroke

e mm: 0.3 (from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1800 Speed Setting value mm: 7,6...8,0

Supply-pump pressure:

Speed 1/min: 1800 Setting value bar: 6,3...6,9

Full-load del. w/out charge press.:

Speed 1/min: 1000

Del.quantity cm3/	<pre>Del.quantity cm3/: -</pre>
1000H.: 36,937,9	1 1000H.: 04,5
Dispersion cm3/: 2,5	I 3rd speed 1/min: 2350
1000H.: (3,0)	Del.quantity cm3/: -
	1000H.: (17,525,5)
Low-idle speed regulation:	1 4th speed 1/min: 2100
Social 1/min 770	Del.quantity cm3/: 36,138,7
Speed 1/min: 379	1000H.: (35,139,,7) 1 5th speed 1/min: 1000
Del.quantity cm3/ 1000H.: 8,012,0	<pre>1 5th speed 1/min: 1000 1 Del.quantity cm3/: -</pre>
Dispersion cm3/: 2,5	1000H.: (35,139,7)
1000H.: (3,0)	1 6th speed 1/min: 1100
Full-load speed regulation:	Del.quantity cm3/: 42,545,5
	1 1000H.: (41,746,3)
Speed 1/min: 2350	7th speed 1/min: 600
Del.quantity cm3/	l Del.quantity cm3/: 34,337,3
1000H: 18,524,5	1 1000H.: (32,838,8)
Start:	Tono delivery (steel):
Start.	l Zero delivery (stop):
Speed 1/min: 100	Mech. shutoff:
Del.quantity mind.	1 Speed 1/min: 2100
cm3/1000H.: 55,0	<pre>Del.quantity cm3/: -</pre>
	1000Н.
Inspection-pump test specifications	Y dia dell'esserie
Test specifications in parentheses	I Idle delivery:
	1 1st speed 1/min: 370
Timing-device characteristic:	Del.quantity cm3/: -
Thinking devise blief determine	1000H.: (6,014,0)
1st speed 1/min: 600	1 2nd speed 1/min: 420 ,
TD travel mm: 0,91,7	<pre>Del.quantity cm3/: -</pre>
mm: (0,62,0)	1000H.: 01,5
2nd speed 1/min: 1800	I 3rd speed 1/min: 500
TD travel mm: -	Del.quantity cm3/: -
mm: (7,18,5) 3rd speed 1/min: 2000	1000H.: 03,0
3rd speed	Automatic starting fuel delivery:
mm: (8,09,4)	I racomacte starting ract detivery.
	1 1st speed 1/min: 400
Supply-pump pressure characteristic:	Del.quantity cm3/: -
	l ind. 1000H: 37,0
1st speed 1/min: 600	
Supply-pump	l 2nd speed 1/min: 480
pressure bar: 3,23,8	1 Timing valve volt: -
2nd speed 1/min: 2000	Del.quantity cm3/: 32,038,0
Supply-pump pressure bar: 6,76,3	! Shutoff electromagnet:
pressure bar. 0,10,5	stratori e tec ti omagne c.
Overflow quantity at overflow valve:	l Cut-in
	I min. voltage : 10,0
1st speed 1/min: 600	I Rated voltage : 12,0
Oveflow : 4183	
quantity cm3/10s: (2698)	Mounting and assembly dimensions:
2nd speed 1/min: 2100	1 Decimation
Overflow : 55138	l Designation
quantity cm3/10s: (40153)	! K mm : - ! KF mm : 5,45,7
Delivery-quant. and breakaway char.:	I MS mm : 1,71,9
1st speed 1/min: 2500	1
1.00 0000	•
Lead	

Remarks:	
	[
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G23	•

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Note inst. in remarks column

Test sheet : FIA 1,7 P1 Edition replaces : 18.12.86

Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R242 Type number : 0 460 494 193 Type number

Customer-specific information

: FIAT Customer

: x8/57 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value bar: 5,5...6,1

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/ Supply-pump 1000H.: 35,5...36,5 cm3/: 3,0 bar: 3,6...4,2 1/min: 1500 pressure Dispersion 2nd speed 1000H : hPa: 1000 Charge press. Supply-pump Full-load del. w/out charge press.: bar: 5,5...6,1 1/min: 2400 pressure 4th speed 1/min : 750 hPa: 1000 Charge press. Del.quantity cm3/ Supply-pump bar: 7,6...8,2 1000H.: 25,3...26,3 pressure Low-idle speed regulation: Overflow quantity at overflow valve: 1st speed 1/min: 350 1/min: 750 Charge press. hPa: -Charge press. hPa: cm3/ Oveflow Del.quantity 1000H.: 12.0...18.0 cm3/: 2.5 1000H.: (3.0) quantity cm3/10s: (26...98) 2nd speed 1/min: 2400 Dispersion Charge press. hPa: 1000 Overflow: 55...138 Full-load speed regulation: quantity cm3/10s: (40...153) 1/min: 2650 Speed Charge press. hPa: 1000 Delivery-quant. and breakaway char.: Del.quantity cm3/ 1000H: 17,0...23,0 1st speed 1/min: 1100 Charge-air pressure-setting hPa: 400 point Del.quantity cm3/: 29.5...30.5 1000H.: (27.8...32.2) 2nd speed 1/min: 2850 Start: Speed 1/min: 100 Del.quantity mind. Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: 0...6,0 cm3/1000H.: 48,0 1/min: 2650 Load-dependent start of delivery: 3rd speed Charge press. hPa: 1000
Del.quantity cm3/: 1000H.: (16,0...24,0)
Sth speed 1/min: 2400 Speed 1/min: 1500 Charge press. hPa: -Charge press. hPa: 1000
Del.quantity cm3/: 35,0...38,0
1000H.: (32,5...40,5)
6th speed 1/min: 1500 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: Charge press. hPa: 1000 Del.quantity cm3/: -1000H.: (33,8...38,2) 1st speed 1/min: 750 1/min: 1100 Charge press. hPa: 1000 7th speed TD travel mm: 1,3...2,1 mm: (1,0...2,4)
2nd speed 1/min: 1500
Charge press. hPa: 1000 Charge press. hPa: Del.quantity cm3/: 24,3...26,7
1000H.: (23,3...27,7)
8th speed 1/min: 750 8th speed TD travel Charge press. hPa: mm: Deliquantity cm3/: mm: (4,4...5,8)1/min: 2400 1000H: (22,8...28,8) 3rd speed Charge press. hPa: 1000 mm: 8,5...9,3 TD travel Zero delivery (stop): mm: (8,2...9,6) Mech. shutoff: 1/min: 2400 Supply-pump pressure characteristic: Speed Del.quantity cm3/: - 1000H. 1st speed 1/min: 750 Charge press. hPa: 1000

```
Idle delivery:
1st speed
              1/min: 350
Del.quantity cm3/:
1000H.:
                      (11,0..19,0)
2nd speed
               1/min: 400
Del.quantity cm3/: 4,0...8,0
1000H.: (2,0...10,0)
              1/min: 520
3rd speed
Del.quantity cm3/: -
1000H.: 0...3,0
Automatic starting fuel delivery:
1st speed
               1/min: 250
Del.quantity cm3/: -
               1000H: 40,0
 ind.
2nd speed
              1/min: 350
Del.quantity cm3/: -
              1000H: 34,0
Shutoff electromagnet:
Cut-in
 min. voltage
                    : 10,0
Rated voltage
                    : 12,0
Mounting and assembly dimensions:
Designation
                    : 3,2...3,4
                    : 5,7...6,0
KF
                mm
MS
                mm
                    65م 1 . 4 . . 1
SVS max.
                mm
                    : 17.0...19.0
: 9.1...12,5
XK
                mm
XL
                mm
```

Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : PEU 1,9 D : 02.04.87 Edition replaces Calibrating oil : ISO 4113 : VE 4/9F2300 R162-1 Injection pump : 0 460 494 195 Type number Customer-specific information Customer : PEUGEOT Engine : XUD9 TEST BENCH REQUIREMENTS Calibrating-oil OC / return temp. with thermometer : 40...48 electronically : 42...50 Inlet press., bar: 0.2 Calibrating nozzle-holder assembly : 1 688 901 022 Opening bar: 130...133 pressure Test inj. tubing : 1 680 750 073 : 6 Outside diameter x Wall thickness : 2 mm: 450 x Length Injection-pump setting values Test specifications in parentheses Timing-device travel: 1/min: 1250 Setting value mm: 3,2...3,6 Supply-pump pressure: Speed 1/min: 1250 Setting value bar: 3,9...4,5 Full-load del. w/out charge press.: 1/min : 1250 Speed Del.quantity cm3/ 1000H.: 29,5...30,5 cm3/: 2,5 1000H.: (3,0)

Low-idle speed regulation: 1/min: 375 Speed Del.quantity cm3/ 1000H.: 8,5...10,5 cm3/: 2,0 Dispersion 1000H.: (3,0) Residual-Delivery Setting Speed 1/min: 550 Del.quantity cm3/ 1000H.: 2,5...3,5 Full-load speed regulation: Speed 1/min: 2400 Del.quantity cm3/ 1000H: 20,0...26,0 Start: Speed 1/min: 100 Del.quantity mind. cm3/1000H.: 44,0 Load-dependent start of delivery: 1/min: 1250 Speed Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 800 mm: 0,7...1,5 mm: (0,4...1,8) 1/min: 1250 TD travel 2nd speed TD travel mm: mm: (2,7...4,1) 1/min: 2000 3rd speed mm: 7,5...8,3 mm: (7,2...8,6) TD trave! Supply-pump pressure characteristic: 1/min: 800 1st speed Supply-pump bar: 2,6...3,2 pressure 2nd speed 1/min: 2000 Supply-pump pressure bar: 5,9...6,5 Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Oveflow cm3/10s: (26...98) quantity 2nd speed 1/min: 2300

Dispersion

```
Over flow
                     : 55...138
 quantity cm3/10s: (40...153)
Delivery-quant. and breakaway char.:
               1/min: 2650
1st speed
Del.quantity cm3/: -
1000H.: 0...7,0
               1/min: 2500
3rd speed
Del.quantity cm3/: 11.5...17.5
1000H.: (10.5...18.5)
               1/min: 2400
4th speed
Del.quantity cm3/: -
1000H.: (19,0...27,0)
               1/min: 2250
5th speed
Del.quantity cm3/: 31,0...34,2)
6th speed
               1/min: 2000
Del.quantity cm3/: 31,5...33,5
1000H.: (30,3...34,7)
               1/min: 1250
7th speed
Del.quantity
                cm3/: -
             1000H.: (27,8...32,2)
               1/min: 800
8th speed
               cm3/: 30,5...33,5
Del quantity
               1000H: (29,0...35,0)
               1/min: 500
cm3/: 29,5...32,5
1000H: (28,0...34,0)
9th speed
Del.quantity
Zero delivery (stop):
Mech. shutoff:
Speed
               1/min: -
Del.quantity cm3/: - 1000H.
Electr. shutoff:
               1/min: 2300
Speed
ELAB
                volt: -
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 375
Del.quantity cm3/: -
             1000H.: (5,5...13,5)
High Idle:
               1/min: 470
Speed
               cm3/: 8,0...10,0
Del quantity
             1000H.: (5,0...13,0)
Residual:
               1/min: 550
Speed
Del.quantity
             1000H.: 0...7,0
Automatic starting fuel delivery:
1st speed
               1/min: 200
```

G28

```
Del.quantity cm3/: -
              1000H: 40,0
 ind.
              1/min: 300
2nd speed
Del.quantity cm3/: -
              1000H: 35,0
Shutoff electromagnet:
Cut-in
                    : 10,0
min. voltage
Rated voltage
                    : 12,0
Mounting and assembly dimensions:
Designation
                      3,2...3,4
               mm
KF
                    : 5,7...6.0
: 1,4..1,55
               mm
MS
               mm
                   : 3.0
: 17.0...19.0
SVS max.
               mm
XK
               mm
                      11,5...14,9
XL
               mm
Setting of residual delivery.
```

Idle setting (LFG) according to VDT-I-460/135.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column Speed : FIA 1,3 B Test sheet : 18.12.86 Edition : 4.86 replaces Calibrating oil : ISO 4113 : VE 4/9F2300 R207-1 Injection pump Speed : 0 460 494 196 Type number Customer-specific information : FIAT-RITMO Customer Start: Engine : x8/34 Speed TEST BENCH REQUIREMENTS Calibrating-cil return temp. with thermometer : 40...48 Speed : 42...50 electronically Inlet press., bar: 0.2 Calibrating nozzle-holder : 1 688 901 022 assembly Opening 1st speed pressure bar : 130...133 TD travel 2nd speed Test inj. tubing : 1 680 750 073 TD travel : 6 Outside diameter 3rd speed x Wall thickness TD travel mm: 450 x Length Injection-pump setting values Test specifications in parentheses 1st speed Supply-pump Timing-device travel: pressure 2nd speed 1/min: 1500 Setting value mm: 4,1...4,5 Supply-pump pressure Supply-pump pressure: 1/min: 1500 Setting value bar: 5,3...5,9 1st speed Oveflow | Full-load del. w/out charge press.: 2nd speed Overflow 1/min : 1500 Speed Del.quantity cm3/ 1000H.: 29,5...30,5 Dispersion cm3/: 2,5 1000H.: (3,0)

Del.quantity cm3/ 1000H: 10.0..14.0 Dispersion cm3/: 2.5 1000H: (3.0) Full-load speed regulation: 1/min: 2450 Del.quantity cm3/ 1000H: 19,0...25,0 1/min: 100 Del.quantity mind. cm3/1000H.: 55.0 Load-dependent start of delivery: 1/min: 1500 Inspection-pump test specifications Test specifications in parentheses Timing-device characteristic: 1/min: 800 mm: 1,6...2,4 mm: (1,3...2,7) 1/min: 1500 mm: · mm: (3,6...5,0)1/min: 2300 mm: 7.0...7.8 mm: (6,7...8,1) Supply-pump pressure characteristic: 1/min: 600 bar: 3,1...3,7 1/min: 2300 bar: 7,2...7,8 Overflow quantity at overflow valve: 1/min: 600 quantity cm3/10s: (26...98)
Ind speed 1/min: 2300 : 55...138 quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: ~

1/min: 390

```
Del.quantity cm3/: -
1000H.: -
               1/min: 2900
2nd speed
Del.quantity cm3/: -
1000H.: 0...1,5
               1/min: 2650
3rd speed
Del.quantity cm3/: 2,0...9,0
1000H.: (1,5...9,5)
4th speed 1/min: 2450
Del.quantity cm3/: -
              1000H.: (18,0...26,0)
5th speed 1/min: 2300
Del.quantity cm3/: 31.8...34.2
1000H.: (30.8...35.2)
               1/min: 1500
6th speed
Del.quantity cm3/: -
1000H.: (27,8...32,2)
               1/min: 1000
7th speed
Del.quantity cm3/: 29,8...32,2
1000H.: (28,7...33,3)
                1/min: 600
8th speed
Del quantity
                cm3/: 30,0...33,0
               1000H: (28,5...34,5)
Zero delivery (stop):
Mech. shutoff:
               1/min: 2300
Speed
Del.quantity cm3/: - 1000H.
Idle delivery:
1st speed
               1/min: 390
Del.quantity cm3/: 1000H.:
                cm3/: -
                       (8,0...16,0)
               1/min: 440
2nd speed
Del.quantity cm5/: 1,0...3,0)
                cm3/: 1,0...7,0
               1/min: 500
3rd speed
Del.quantity cm3/: -
1000H.: 0...1,5
Automatic starting fuel delivery:
1st speed
               1/min: 300
Del.quantity cm3/: -
               1000H: 48,0
 ind.
2nd speed
               1/min: 400
               cm3/: -
Del.quantity
               1000H: 45_0
 ax.
Shutoff electromagnet:
Cut-in
                     : 10,0
min. voltage
Rated voltage
                     : 12,0
Mounting and assembly dimensions:
```

H₀2

Designation K mm : 3,2...3,4 KF mm : 5,7...5,9 MS mm : 1,7...1,9 SVS max. mm : 2,8

Note inst. in remarks column

Test sheet : OPE 2.3 M Edition : 12.12.86

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/9F2200 L243 Type number : 0 460 494 197

Customer-specific information

Customer : OPEL

Engine : 2,3 LIT.

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.3

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm : 840

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200 Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1200 Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min: 1200

Del.quantity cm3/

1000H.: 43,0..44,0

Dispersion cm3/: 3,0 1000H.: -

	2nd speed 1/min: 2200
Low-idle speed regulation:	<pre>0verflow : 55138 quantity cm3/10s: (40153)</pre>
Speed 1/min: 270	•
Del.quantity cm3/	Delivery-quant, and breakaway char.:
1000H.: 10.014.0 Dispersion cm3/: 2.5	1st speed 1/min: 2700 Del.quantity cm3/: -
1000H.: (3,0)	1000H.: 03,0
full-load speed regulation:	3rd speed 1/min: 2600
Speed 1/min: 2450	Del.quantity cm3/: 4,012,0 1000H.: (4,012,0)
Dei.quantity cm3/	4th speed 1/min: 2450
1000H: 21,027,0	Del.quantity cm3/: -
Start:	1000H.: (20,028,0) 5th speed 1/min: 2200
	Del.guantity cm3/: 34.837.8
Speed 1/min: 100 !	Del.quantity cm3/: 34,837,8 1000H.: (34,038,6)
Del.quantity mind. cm3/1000H.: 52,0	6th speed 1/min: 1200
tilis/1900it 32,0	Del.quantity cm3/: - 1000H.: (41,245,8)
Load-dependent start of delivery:	7th speed 1/min: 600
Second % (min. 1300	Del.quantity cm3/: 33,536,5
Speed 7/min: 1200	1000H.: (32,038,0)
Inspection-pump test specifications	Zero delivery (stop):
Test specifications in parentheses	Mach abutaff.
	Mech. shutoff: Speed 1/min: -
Timing-device characteristic:	Del.quantity cm3/: -
	1000H.
1st speed	Electr. shutoff:
mm: (0,31,7)	Speed 1/min: 2200
2nd speed 1/min: 800 _ l	ELAB volt: -
T9 travel mm: 1,92,7	Del.quantity cm3/: -
mm: (1,63,0) 3rd speed 1/min: 1200	1000H.
TD travel mm: -	Idle delivery:
mm: (3,84,2)	4 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2
4th speed 1/min: 2200 TD travel mm: 9,710,5	1st speed 1/min: 270
mm: (9,410,8)	Del.quantity cm3/: - 1000H.: (8,016,0) 2nd speed 1/min: 320
	2nd speed 1/min: 320
Supply-pump pressure characteristic:	Del.quantity cm3/: 3.09.0 1000H.: (2.010.0)
1st speed 1/min: 600	3rd speed 1/min: 400
Supply-pump !	Del.quantity cm3/: -
pressure bar: 2,43,0	1000H.: 02,5
2nd speed 1/min: 800 Supply-pump	Automatic starting fuel delivery:
pressure bar: 3,03,6	
3rd speed 1/min: 2200	1st speed 1/min: 130
Supply-pump	Del.quantity cm3/: - ind. 1000H: 52,0
p. 00001 0 bull 0 0 0 0 1 1 1	·
Overflow quantity at overflow valve:	2nd speed 1/min: 230
1 1st speed 1/min: 600	Del.quantity cm3/: - ax. 1000H: 35,0
1st speed	ax. 1000H: 35,0
quantity cm3/10s: (2698)	Shutoff electromagnet:
HO.	-
H04	

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

mm : 3,2...3,4 mm : 5,7...6,0 mm : 1,8..2,05 mm : -mm : 17,0...19,0 mm : 9,7...13,4 KF MS SVS max.

ΧK XL

Note inst. in remarks column

Test sheet : REN 2,0F1 : 02.04.87 Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R158-1 Type number : 0 460 494 198

Type number

Customer-specific information : RENAULT Customer

Engine : J8S-A01

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.3

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening -

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x in gth

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1400 Setting value mm: 4,4...4,8

Supply-pump pressure:

1/min: 1400 Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

1/min : 1400 Speed

Del.quantity cm3/

1000H.: 35,0...36,0 cm3/: 2,5 1000H.: (3,0) Dispersion

	Del.quantity cm3/: -
Low-idle speed regulation:	1000H.: 05,0 3rd speed 1/min: 2400
Speed 1/min: 425	Del.quantity cm3/: - 1000H.: (16,024,0)
Del.quantity cm3/ 1 1000H.: 7,011,0	4th speed 1/min: 22UU
Dispersion cm3/: 2,5 1 1000H.: (3,0) 1	Del.quantity cm3/: 37,039,0 1000H.: (35,740,3)
Full-load speed regulation:	5th speed 1/min: 2100
Speed 1/min: 2400	Del.quantity cm3/: 37,539,5 1000H.: (36,240,8)
Del.quantity cm3/ 1000H: 17,023,0	6th speed 1/min: 1400 Del.quantity cm3/: - 1000H.: (33,237,8)
Start:	/th speed 1/min: 1000
Speed 1/min: 100	Del.quantity cm3/: 34,037,0 1000H.: (33,237,8)
Del.quantity mind.	
cm371000H.: 52,0	Zero delivery (stop):
Load-dependent start of delivery:	Mech. shutoff: Speed 1/min: -
Speed 1/min: 1400	Del.quantity cm3/: - 1000H.
Inspection-pump test specifications	
Test specifications in parentheses	Electr. shutoff: Speed 1/min: 425
Timing-device characteristic:	ELAB volt: - Del.quantity cm3/: 3
	1000H.
1st speed	Idle delivery:
mm: (1,33,7) 1 2nd speed 1/min: 1400 1	1st speed 1/min: 425
TD travel mm: - 1 mm: (3,95,3)	Del.quantity cm3/: - 1000H.: (5,013,0)
3rd speed 1/min: 2000 1	2nd speed 1/min: 650
TD travel mm: 6,77,5 mm: (6,47,8)	Del.quantity cm3/: - 1000H.: 05,0
Supply-pump pressure characteristic:	Automatic starting fuel delivery:
1st speed	1st speed 1/min: 370
Supply-pump 1 pressure bar: 3,94,5	Del.quantity cm3/: - ind. 1000H: 45,0
2nd speed 1/min: 2000	2nd speed 1/min: 480
Supply-pump pressure bar: 6,57,1	Del.quantity cm3/: -
Overflow quantity at overflow valve:	ax. 1000H: 45,0
1st speed 1/min: 1000	Shutoff electromagnet:
Oveflow : 55138	Cut-in
quantity cm3/10s: (40153)	min. voltage : 10,0 Rated voltage : 12,0
Overflow : 55138 quantity cm3/10s: (40153)	Mounting and assembly dimensions:
Delivery-quant. and breakaway char.: I 1st speed	Designation K mm : 3,23,4
H07	

KF MS SVS max. XK XL mm : 5,7...5,9 mm : 1,4...1,6 mm : 3,6 mm : 18,8...20,8 mm : 9,4...12,8

Note inst. in remarks column

Test sheet : OPE 2,3 M1 Edition : 12.12.86

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/9F2200 L243-2 Type number : 0 460 494 203

Type number : 0 460 494 203

Customer-specific information Customer : OPEL

: 2.3 LIT. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.3

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1200 Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1200 Speed Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

1/min: 1200 Speed

Del.quantity cm3/

1000H.: 43,0..44,0

cm3/: 3,0 Dispersion 1000H.: -

2nd speed 1/min: 2200 : 55...138 Low-idle speed regulation: Overflow quantity cm3/10s: (40...153) Speed 1/min: 270 Del.quantity cm3/ Delivery-quart. and breakaway char.: 1000H.: 10,0...14,0 cm3/: 2,5 1000H.: (3,0) 1st speed 1/min: 2700 Del.quantity cm3/: -1000H.: 0...3,0 Dispersion 1/min: 2600 Full-load speed regulation: 3rd speed Del.quantity cm3/: 4,0...12,0 1000H.: (4,0...12,0) 4th speed 1/min: 2450 1/min: 2450 Speed Deliquantity cm3/ Del.quantity cm3/: -1000H.: (20,0...28,0) 1000H: 21,0...27,0 Start: 1/min: 2200 5th speed Del.quantity cm5/: 34,0...38,6) Speed 1/min: 100 1/min: 1200 Del.quantity mind. 6th speed Del.quantity cm3/: 1000H.: (41,2...45,8) cm3/1000H.: 52,0 Load-dependent start of delivery: 1/min: 600 7th speed Del.quantity cm3/: 33,5...36,5 1000H.: (32,0...38,0) Speed 1/min: 1200 Inspection-pump test specifications Zero delivery (stop): Test specifications in parentheses Mech. shutoff: Speed 1/min: -Del.quantity cm3/: - 1000H. Timing-device characteristic: 1/min: 600 1st speed TD travel mm: 0,6...1,4 Electr. shutoff: mm: (0,3...1,7)Speed 1/min: 2200 2nd speed 1/min: 800 ELAB volt: mm: 1,9...2,7 mm: (1,6...3,0) Del.quantity cm3/: - 1000H. TD travel 1/min: 1200 3rd speed TD travel mm: -Idle delivery: mm: (3,8...4,2) 1/min: 2200 1/min: 270 4th speed 1st speed Del.quantity cm3/: -1000H.: (8,0...16,0) mm: 9,7...10,5 mm: (9,4...10,8) TD travel 1/min: 320 2nd speed Del.quantity cm3/: 3.0...9.0 1000H.: (2.0...10.0) Supply-pump pressure characteristic: 1/min: 600 1/min: 400 1st speed 3rd speed Del.quantity cm3/: -1000H.: 0...2,5 Supply-pump bar: 2,4...3,0 pressure 2nd speed 1/min: 800 Automatic starting fuel delivery: Supply-pump bar: 3,0...3,6 pressure 3rd speed 1/min: 2200 1/min: 130 1st speed Supply-pump Del.quantity cm3/: 1000H: 52,0 pressure bar: 6,5...7,1 ind. Overflow quantity at overflow valve: 1/min: 230 2nd speed Del.quantity cm3/: 1000H: 35,0 1st speed 1/min: 600 ax. Oveflow : 41...83 quantity cm3/10s: (26...98) Shutoff electromagnet: H10

Cut-in min. voltage : 10.0 Rated voltage : 12.0 XK mm : 18.7...20.7 XL mm : 9,3...12,7

Note inst. in remarks column

: FIA 1,7 P2 Test sheet : 18.12.86 Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R256
Type number : 0.460.494.204 : 0 460 494 204 Type number

Customer-specific information : FIAT UNO Customer

: X8/34 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder : 1 688 901 022 assembly

Opening

bar : 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1500 Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

1/min : 1500 Speed Del.quantity cm3/

1000H.: 29,5...30,5 cm3/: 2,5 1000H.: (3,0) Dispersion

. restrett

1

Low-idle speed regulation:	Del.quantity cm3/: 1,58,5 1000H.: (1,09,0)
and special significant	4th speed 1/min: 2450
Speed 1/min: 390 Del.quantity cm3/	Del.quantity cm3/: 19.025.0 1000H: (18.026.0)
1000H.: 10,014,0	5th speed 1/min* 2500
Dispersion cm3/: 2.0 1 1000H.: (3.0)	Del.quantity cm3/: - 1000H.: (30,835,2)
Full-load speed regulation:	6th speed 1/min: 1500 Del.quantity cm3/: -
Speed 1/min: 2300	1000H.: (27,832,2)
Del.quantity cm3/	7th speed 1/min: 1000
1000H: 31,834,2	Del.quantity cm3/: 28,831,2 1000H.: (27,832,2)
Start:	8th speed 1/min: 600
Speed 1/min: 100	Del.quantity cm3/: 30,033,0 1000H: (28,534,5)
Del.quantity mind. cm3/1000H.: 55,0	Zero delivery (stop):
Load-dependent start of delivery:	Mech. shutoff: Speed 1/min: 2300
Speed 1/min: 1500	Del.quantity cm3/: -
Inspection-pump test specifications	100011.
Test specifications in parentheses	Idle delivery:
i	1st speed 1/min: 390
Timing-device characteristic:	Del.quantity cm3/: -
	1000H.: (8,016,0)
1st speed 1/min: 800	2nd speed 1/min: 440
TD travel mm: 1,22,0 mm: (0,92,3)	Del.quantity cm3/: 06.0 1000H.: (07,0)
2nd speed 1/min: 1500	3rd speed 1/min: 500
TD travel mm: -	Del.quantity cm3/: -
mm: (3,85,2)	1000H.: 02,5
3rd speed 1/min: 2300	
TD travel mm: 7,48,2 mm: (7,18,5)	Automatic starting fuel delivery:
Cumply-cump energy no observatoriation	1st speed 1/min: 300
Supply-pump pressure characteristic:	Del.quantity cm3/: - ind. 1000H: 48,0
1st speed 1/min: 600	2-1
Supply-pump	2nd speed 1/min: 400
pressure bar: 3,13,7 2nd speed 1/min: 2300	Del.quantity cm3/: - ax. 1000H: 45,0
Supply-pump	ax. 100011. 43,0
pressure bar: 7,17,7	Shutoff electromagnet:
Overflow quantity at overflow valve:	Cut-in . 10.0
1st speed 1/min: 2300	min. voltage : 10,0 Rated voltage : 12,0
1st speed	nated vortage . 12,0
quantity cm3/10s: (40153)	Mounting and assembly dimensions:
Delivery-quant, and breakaway char.:	Designation
1st speed 1/min: 2900	K mm : 3,23,4
Del.quantity cm3/: -	KF mm: 5,76,0
1000H.: 01 _. 5	MS mm: 1,71,95
3rd speed 1/min: 2650	SVS max. mm : -
H13	

XK XL

Remarks:

mm : 17.0...19.0 mm : 9,8...13,2

H14

Note inst. in remarks column

Test sheet : VWW 1,6 W19 Edition : 02.04.87

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R221-2 Type number : 0 460 494 207

Customer-specific information

Customer

: 086-1,6L Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Setting value mm: 2,1...2,5

Supply-pump pressure:

1/min: 1250 Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

1/min : 1000 Speed

Del.quantity cm3/ 1000H.: 28,5...29,5

Low-idle speed regulation:

1/min: 375 Delivery-quant. and breakaway char.: Speed Speed Del.quantity cm3/ 1000H.: 12,0...14,0 1st speed 1/min: 2800 Del.quantity cm3/: -1000H.: 0...4,0 Residual-Delivery Setting 1/min: 550 Speed 3rd speed 1/min: 2600 Del.quantity cm3/: -1000H.: (10,0...18,0) 4th speed 1/min: 2500 Del.quantity cm3/ 1000H.: 2,5...3,5 Full-load speed regulation: Del.quantity cm3/: 19.0...29.0 1000H.: (18.0...30.0) 1/min: 2600 Speed 1/min: 2400 Del.quantity cm3/ 5th speed Del.quantity cm3/: 27,5...29,5 1000H.: (26,3...30,7) 6th speed 1/min: 1000 1000H: 11,0...17,0 Start: Del.quantity cm3/: -1000H.: (26,8...31,2) Speed 1/min: 100 Del.quantity mind. 1/min: 600 7th speed Del.quantity cm3/: 22,5...25,5 1000H.: (21,0...27,0) cm3/1000H.: 35,0 Load-dependent start of delivery: Zero delivery (stop): Speed 1/min: 1250 Mech. shutoff: 1/min: -Inspection-pump test specifications Speed Deliquantity cm3/: - 1000H. Test specifications in parentheses Timing-device characteristic: Electr. shutoff: Speed 1/min: 425 ELAB 1/min: 1000 volt: -1st speed mm: 1.0...1.8 mm: (0.7...2.1) Del.quantity cm3/: - 1000H. TD travel 2nd speed 1/min: 1250 TD travel Idle delivery: mm: mm: (1,6...3,0)1/min: 1800 1/min: 375 3rd speed 1st speed Del.quantity cm3/: -1000H.: (9,0...17,0) 2nd speed 1/min: 425 mm: 4,2...5,0 mm: (3,0...5,3) TD travel 1/min: 2400 4th speed Del.quantity cm3/: 5.5...8.5 1000H.: (3,0...11,0) mm: 6,1...6,9 mm: (5,8...7,2) TD travel High Idle: Speed 1/min: 525
Del.quantity cm3/: 7,0...9,0
1000H.: (4,0...12,0) Supply-pump pressure characteristic: 1st speed 1/min: 600 Supply-pump pressure bar: 1,9...2,9 Residual: 1/min: 2400 1/min: 500 Speed 2nd speed Del.quantity Supp!y-pump : 2,5...4,5 1000H.: (1,0...6,0) bar: 7,1...8,1 pressure Overflow quantity at overflow valve: Automatic starting fuel delivery: 1/min: 600 1st speed 1/min: 180 1st speed Oveflow : 55...70 cm3/: -Del.quantity cm3/10s: (50...75) 1/min: 2400 1000H: 35,0 ind. quantity 2nd speed Overflow verflow : 82...112 quantity cm3/10s: (77...117) 1/min: 380 2nd speed **H16**

Del.quantity cm3/: - ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

mm : 3,2...3,4 mm : 5,7...6,0 mm : 1,3..1,55 mm : 3,1 K KF MS

SVS max.

Setting of residual delivery.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Low-idle speed regulation: Note inst. in remarks column 1/min: 375 Speed Del.quantity cm3/ 1000H.: 8,0...10,0 Test sheet : PEU 1,9 G cm3/: 2,0 Edition : 16.12.86 Dispersion 1000H.: (3,0) replaces Calibrating oil : ISO 4113 Residual-Delivery Setting 1/min: 550 Speed Injection pump : VE 4/9F2300 R272 Del.quantity cm3/ : 0 460 494 211 1000H.: 2,5...3,5 Type number Full-load speed regulation: Customer-specific information Customer : PEUGEOT 1/min: 2500 Speed Del.quantity cm3/ 1000H: 19,0...25,0 Engine : XUD 9A TEST BENCH REQUIREMENTS Start: Calibrating-oil 1/min: 100 Speed return temp. Del.quantity mind. cm3/1000H.: 45,0 with thermometer : 40...48 : 42...50 electronically Load-dependent start of delivery: Inlet press., bar: 0.3 Speed 1/min: 1250 Calibrating nozzle-holder : 1 688 901 022 assembly Inspection-pump test specifications Test specifications in parentheses Opening bar: 130...133 pressure Timing-device characteristic: Test inj. tubing : 1 680 750 073 1/min: 800 1st speed TD travel mm: 0,6...1,41/min: 1250 Outside diameter : 6 2nd speed x Wall thickness : 2 TD travel mm: mm: (2,5...3,9) 1/min: 2000 mm: 450 x Length 3rd speed mm: 6,7...7,5 mm: (6,4...7,8) Injection-pump setting values TD travel Test specifications in parentheses Supply-pump pressure characteristic: Timing-device travel: Speed 1/min: 1250 1st speed 1/min: 800 Setting value mm: 3,0...3,4 Supply-pump bar: 2,6...3,2 pressure Supply-pump pressure: 4/min: 2000 2nd speed Supply-pump bar: 5,9...6,5 1/min: 1250 Speed pressure Setting value bar: 3,9...4,5 Overflow quantity at overflow valve: Full-load del. w/out charge press.: 1st speed 1/min: 800 Oveflow | : 41...83 Speed 1/min : 1250 cm3/10s: (26...98) 1/min: 2300 Del.quantity cm3/ quantity 1000H.: 29.5...30,5 cm3/: 2,5 2nd speed : 55...138 Over flow Dispersion 1000H.: (3,0) quantity cm3/10s: (40...153)

H18

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Delivery-quant. and breakaway char.:
1st speed
              1/min: 2650
Del.quantity cm3/: -
1000H.: 0...10,0
3rd speed
               1/min: 2500
               cm3/: -
Del.quantity
             1000H.: (18,0...26,0)
4th speed
               1/min: 2250
Del.quantity cm3/: 31,5...34,5
1000H:: (30,8...35,2)
               1/min: 1250
5th speed
Deliquantity cm3/:
1000H.: (27,8...32,2)
6th speed 1/min: 800
Del.quantity cm3/: 30,5...33,5
              1000H.: (29,0...35,0)
              1/min: 500
7th speed
Del.quantity cm3/: 30.5...33.5
1000H.: (29.0...35.0)
Zero delivery (stop):
Mech. shutoff:
              1/min: 2300
Speed
Del.quantity cm3/: -
             1000H.
Idle delivery:
              1/min: 375
1st speed
Del.quantity cm3/: -
             1000H.: (5,0...13,0)
High Idle:
               1/min: 470
Speed
Del.quantity cm3/: 8.0...10.0
1000H.: (5.0...13.0)
Residual:
              1/min: 550
Speed
Del quantity
             1000H.: 0...7,0
Automatic starting fuel delivery:
              1/min: 200
1st speed
Del.quantity cm3/: -
              1000H: 40,0
 ind.
              1/min: 300
2nd speed
Del.quantity cm3/: -
               1000H: 35,0
 ax.
Shutoff electromagnet:
Cut-in
min. voltage
                    : 10,0
Rated voltage
                    : 12,0
Mounting and assembly dimensions:
```

H19

Note inst. in remarks column

Test sheet : FIA 1.9 E1 Edition : 16.12.86

replaces

Calibrating oil : ISO 4113

Injection pump Type number : VE 4/9F2300 R141-1

: 0 460 494 212

Customer-specific information

: FIAT Customer

: x8/43 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. °C

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.2

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1500 Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

1/min : 1500 Speed

Del.quantity cm3/

1000H.: 29,2...30,2 cm3/: 2,5 1000H.: (3,0) Dispersion

1	Del.quantity cm3/: -
Low-idle speed regulation:	1000H.: -
Speed 1/min: 390	2nd speed 1/min: 2600 Del.quantity cm3/: 3,010,0
Del.quantity cm3/	1000H.: (2,510,5)
1000H.: 9,013,0	3rd speed 1/min: 2500
Dispersion cm3/: 2,5	Del.quantity cm3/: -
1000H.: (3,0) Full-load speed regulation:	1000H.: (10,018,0) 4th speed 1/min: 2400
l acc toda speca regarderon:	Del.quantity cm3/: 21,027,0
Speed 1/min: 2500	1000H.: (20,028,0)
Del.quantity cm3/	5th speed 1/min: 2250
1000H: 11,017,0	Del.quantity cm3/: 31,033,4 1000H.: (30,,034,4)
Start:	6th speed 1/min: 1500
Second 4 (view 400)	Del.quantity cm3/: -
Speed 1/min: 100 Del.quantity mind.	1000H.: (26,531,9) 7th speed 1/min: 1000
cm3/1000H.: 55.0	Del.quantity cm3/: 28,931,5
	1000H.: (28,032,4)
Load-dependent start of delivery:	8th speed 1/min: 600
Speed 1/min: 1500	Del.quantity cm3/: 30,033,0 1000H: (28,534,5)
Inspection-pump test specifications	Zero delivery (stop):
Test specifications in parentheses	Mech. shutoff:
İ	Speed 1/min: 2300
Timing-device characteristic:	Del.quantity cm3/: - 1000H.
1st speed 1/min: 800	1000H.
TD travel mm: 1,72,5	Idle delivery:
mm: (1,42,8)	•
2nd speed 1/min: 1500 i TD travel mm: -	1st speed 1/min: 390
TD travel mm: -	Del.quantity cm3/: - 1000H.: (7,015,0)
3rd speed 1/min: 2300	2nd speed 1/min: 440
TD travel mm: 7.17.9	Del.quantity cm3/: 1,07,0 1000H.: (08,0)
mm: (6,88,2)	1000H.: (08,0) 3rd speed 1/min: 500
Supply-pump pressure characteristic:	Del.quantity cm3/: -
	1000H.: 02,5
1st speed 1/min: 400 Supply-pump	Automatic starting fuel delivery:
pressure bar: 2,83,4	nationality state of the state
2nd speed 1/min: 2300	1st speed 1/min: 300
Supply-pump pressure bar: 7,48,0	Del.quantity cm3/: - ind. 1000H: 45,0
pressure bar. 1,40,0	1110. 100011. 43,0
Overflow quantity at overflow valve:	2nd speed 1/min: 400
1st seed 1/min /00	Del.quantity cm3/: -
1st speed	ax. 1000H: 46,0
quantity cm3/10s: (2698)	Shutoff electromagnet:
2nd speed 1/min: 2300	Cook in
Overflow : 55138 quantity cm3/10s: (40153)	Cut-in min. voltage : 10,0
quality clib/103. (40.11133/	Rated voltage : 12,0
Delivery-quant. and breakaway char.:	
1st speed 1/min: -	Mounting and assembly dimensions:
H21	
7.00	

Designation K KF MS SVS max. XK XL : 3,1...3,4 : 5,7...6,0 : 1,7...1,9 : 2,8 : 20,2...22,2 : 10,3...13,7 mm mm mm mm

mm mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : VOL 10,0 Q2 : 12.06.87 : 23.9.86 Calibrating oil : ISO-4113

: 0 401 846 758 Combination no.

Injection pump Pump designation : PE6P110A320R\$3108Z

EP type number : 0 411 816 728

Governor

Governor design. : RQV250...1100PA649 Governor no. : 0 421 813 346

Customer-spec. information Customer : VOLVO

: THD100EB Engine

1st version kW : 160.0 Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.1⁹ : (2.95...3.15) Prestroke mm Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1-5- 3- 6- 2- 4 HIGHEST RATED SPEED 1st version Control-lever SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) position degrees: 61...69 Testing: SD mark cyl. no. : 1 1st c-rod trav.mm : 9.50 Speed 1/min : 1160...1170 BASIC SETTING 2nd c-rod trav.mm: 4.00 Speed 1/min: 1225...1255 th speed 1/min: 1350 C-rod trav.mm: 0.00...1.00 1st speed 1/mi: 700 4th speed Contr.-rod trav.mm: 10.50...10.60 LOWEST RATED SPEED I Del.quantity cm3/: 12.2...12.4 Control-lever position degrees: 7...15 100H.: (11.9...12.7) Testing: Dispersion cm3/:0.41/min : 100 Speed C-rod trav.mm min : 6.80 Speed 1/min: 250 G-rod trav.mm: 5.30...5.50 G-rod trav.mm: 2.00 100H.: (0.7) 1/min: 250.0 2nd speed Contr.-rod trav. m: 5.3...5.5
Del.quantity cm3/: 3.0...3.4
100H.: (2.7...3.6)
Dispersion cm3/: 0.3
100H.: (0.6) 1/min : 350...410 Speed compensator (LDA_ADA_ALDA) 1st version Setting (B) Setting of injection pump with 1/min : 500 hPa : 750 externally-mounted governor Speed Pressure SLEEVE TRAVELS Contr.-rod trav.mm: 10.50...10.60 1st speed 1/min: 250 Sleeve travel mm: 1.10...1.30
2nd speed 1/min: 500
Sleeve travel mm: 4.10...4.90
3rd speed 1/min: 700 Measurement 1/min : 500 Speed 1st pressure hPa : -Sleeve travel mm: 6.30...6.70 : 9.60...9.80 C-rod trav.mm 4th speed 1/min: 950 2nd pressure hPa : 265 Sleeve travel mm: 6.30...6.70 C-rod trav.mm : 9.90...10.00 3rd pressure hPa : 310 5th speed 1/min: 1100 Sleeve travel mm: 7.00...7.50 C-rod trav.mm : 10.20...10.40 SLEEVE POSITION FUEL-DELIVERY CHARACTERISTICS Charge press. hPa: -Speed 1/min: 700 Control-lever position Degree: -1 1/min: 1175 Del.quantity cm3/: 105.5...108.5 Speed Cont.-rod travelmm: 15.20...17.80 1000H.: (103.0...111.0) FULL-LOAD DELIV. AT FULL-LOAD STOP STARTING FUEL DELIVERY 1st version Speed 1/min: 700 Charge press. hPa: 750 Del.quantity cm3/: 122.0...124.0 1000H.: (119.0...127.0) Dispersion cm3/: 4.00 Speed 1/min: 100 Del.quantity cm3/: 160.0...190.0 Contr.-rod trav.mm: 20.00...21.00 1000H.: (7.50) LOW IDLE H24

Speed 1/min: 250
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/: 30.0...34.0
1000H.: (27.5...36.5)
Dispersion cm3/: 3.00
1000H.: (6.00)

Remarks:

SETTING OF FBG
-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.70 (19.2...19.80).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 48.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 335 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.00 (1.00) Test sheet : MB 2,0 P7 Edition : 14.11.86 Superceeded SD mark cyl. no. : 1 Calibrating oil : ISO-4113 BASIC SETTING. : 0 400 074 918 Combination no. 1/mi: 1000 1st speed Injection pump Pump designation : PES4M55C32ORS152-3 Contr.-rod trav.mm: 11.10...11.20 EP type number : 0 4(3) 054 967 Del.quantity cm3/: 3.1...3.2 Governor Governor design.: RSF360/2300M59-16 Governer no. 100H.: (3.0...3.3) : 0 420 021 076 Customer-spec. information Dispersion cm3/:0.2Customer : DB 100H.: (0.3) Engine : 0M601 (2.0 L) 2nd speed 1/min: 335.0 Contr.-rod trav, m: 5.4...5.6 1st version kW : 53.0 Del.quantity cm3/: 0.5...0.6 TEST BENCH REQUIREMENTS 300Ha: (0.4...0.9) ~m3/: 0.1 100H.: (0.1) Diepersion Calibrating-oil inlet temp. C : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version 1/min: 1000 Speed Del.quantity cm3/: 31.0...32.0 Inlet press., bar : 1.00 1000H.: (30.0...33.0) cm3/ : 2.50 1000H.: (3.00) Calibrating nozzle-holder Dispersion : 0 681 343 009 assembly Opening HIGHEST RATED SPEED pressure, bar : 172...175 1st version Control-lever position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20 Test inj. tubing : 1 680 750 014 Speed 1/min : 0...2500 1/min : 2950 /.mm : 0.00...1.00 4th speed Outside diameter x Wall thickness C-rod trav.mm : 6.00x2.00x609 x Length mm SET IDLE CONTROL-LEVER POSITION (A) Injection pump setting values Insp. values in parentheses 1/min : 1000 Speed Set constant delivery quant. Contr.-rod trav.mm: 0,90...1,00 per values ____ LOWEST RATED SPEED I START OF DELIVERY Control-lever position degrees: 13...17 Test pressure, bar: 30...32 Setting point w/out aux. spring Prestroke mm : 2.00...2.10 1/min : 335 : (1.95...2.15) Contr.-rod trav.mm: 5.5 Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1- 3- 4- 2 Testing:

H27

Speed 1/min : 225 C-rod trav.mm min: 9.50 Speed 1/min: 335 : 5.40...5.60 C-rod trav.mm : 1.50 C-rod trav.mm 1/min : 590...690 Speed Speed 1/min : 1000 C-rod trav.mm max : 1.00 SET IDLE AUXILIARY SPRING Speed 1/min : 400 Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version C-rod trav.mm : 11.10...11.20 2nd speed 1/min : 1800 C-rod trav.mm : 10.80...11.00 3rd speed 1/m²n : 2200 C-rod trav.mm : 10.30...10.50 FUEL-DELIVERY CHARACTERISTICS Speed 1/man : 1800 Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.0...35.0 1000H.: (32.0...36.0) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 2500 : 2500 Contr.-rod 2 2 ...m: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50 Dispersion 1000H.: (3.00) LOW IDLE Speed 1/min: 335 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H,: (4.5...9.0) cm3/: 1.00 Dispersion 1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop Speed 1/min: 335 Control trav.mm: (12,00...13,40) Del.quantity cm3/: (31,00...38,00) 1000H.: -

Electric current A: 1,8 Control lever at full-load stop Speed 1/min: 2950

Contr.-rod trav.mm: 0,00...1,00 Electric current

short-duration A: 3,00 Starting test

Speed 1/min: 100
Del.quantity cm3/: min. 1000H.: 55,00

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.80).

Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowab: after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 48.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 335 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.00 (1.00) Test sheet : MB 2.0 P8 : 07.11.86 Edition Superceeded SD mark cyl. no. : 1 Calibrating oil : ISO-4113 BASIC SETTING Combination no. : 0 400 074 919 1st speed 1/mi: 1000 Injection pump Contr.-rod trav.mm: 11.10...11.20 Pump designation : PES4M55C32ORS152-3 EP type number : 0 410 054 967 Governor Del.quantity cm3/: 3.1...3.2 Governor design. : RSF375/2300M55-15 100H.: (3.0...3.3) Governer no. : 0 420 021 069 cm3/:0.2Customer-spec. information Dispersion Customer : DB 100H.: (0.3) : 0M601 (2.0 L) Engine 2nd speed 1/min: 375.0 Contr.-rod trav. m: 5.4...5.6 Del.quantity cm3/: 0.5...0.6 100H:: (0.4...0.9) Dispersion cm3/: 0.1 100H:: (0.1) 1st version kW : 53.0 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version 1/min: 1000 Speed Del.quantity cm3/: 31.0...32.0 Inlet press., bar : 1.00 1000H: (30.0...33.0) cm3/: 2.50 1000H: (3.00) Calibrating nozzle-holder Dispersion : 0 681 343 009 assembly HIGHEST RATED SPEED Opening pressure, bar : 172...175 1st version Control-lever position degrees: 50...0

3rd c-rod trav.mm: 7,80...8,20

Speed 1/min: 0...2500 Test inj. tubing : 1 680 750 014 th speed 1/min : 2950 C-rod trav.mm : 0.00...1.00 Outside diameter 4th speed x Wall thickness x Length mm : 6.00X2.00X600 SET IDLE CONTROL-LEVER (A) Injection pump setting values POSITION Insp. values in parentheses Set constant delivery quant. 1/min: 1000 Speed Contr.-rod trav.mm: 0,90...1,00 per values ____ LOWEST RATED SPEED I Control-lever START OF DELIVERY position degrees: 13...17 Test pressure, bar: 30...32 Setting point w/out aux. spring 1/min : 375 Prestroke mm : 2.00...2.10 Speed Contra-rod tray.mm: 5.5 : (1.95...2.15) Contr.-rod trav.mm: 20.00...22 30 Cam sequence : 1- 3- 4-Testing:

1/min : 250 Speed C-rod trav.mm min : 11.50 Speed 1/min : 375 C-rod trav.mm : 5.40...5.60 : 1.50 C-rod trav.mm 1/min : 630...730 Speed 1/min : 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING 1/min : 400 Speed Contr.-rod trav.mm: 4,40...4,60 : (4,30...4,70) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 C-rod trav.mm : 11.10...11.20 2nd speed 1/min: 1800 C-rod trav.mm : 10.80...11.00 3rd speed 1/min : 2200 C-rod trav.mm : 10.30...10.50 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H:: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.0...35.0 1000H.: (32.0...36.0) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50Dispersion 1000H.: (3.00) LOW IDLE Speed 1/min: 375 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) cm3/: 1.00 Dispersion 1000H.: (1.50)

102

SETTING PNUEUMATIC FAST IDLE

1/min : 425 Speed Contr.=rod trav.mm: (7,00...8,60) Del.quantity cm3/: (13,00...21,00) 1000H.: -

hPa : 0,40 Vacuum

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.80). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing GS: 0-90-180-270 Tolerance + - : 0.00 (1.00) Test sheet : MB 2.0 P9 : 05.11.86 Edition Superceeded SD mark cyl. no. : 1 Calibrating oil : ISO-4113 BASIC SETTING Combination no. : 0 400 074 920 1/mi: 1000 1st speed Injection pump Pump designation : PES4M55C32ORS152-3 EP type number : 0 410 054 967 Contr.-rod trav.mm: 11.10...11.20 Del.quantity cm3/: 3.1...3.2 Governor Governor design. : RSF375/2300M55-14 Governer no. 100H.: (3.0...3.3) : 0 420 021 068 Dispersion cm3/:0.2Customer-spec. information Customer : DB 100H.: (0.3) Engine : 0M601 (2.0 L) 2nd speed 1/min: 375.0 Contr.-rod trav. m: 5.4...5.6 Del.quantity cm3/: 0.5...0.6 1st version kW : 53.0 100H.: (0.4...0.9) cm3/: 0.1 TEST BENCH REQUIREMENTS Dispersion Calibrating-oil inlet temp. OC 100H.: (0.1) : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version 1/min: 1000 Speed Del.quantity cm3/: 31.0...32.9 Inlet press., bar: 1.00 1000H.: (30.0...35.0) cm3/ : 2.50 1000H.: (3.00) Calibrating nozzle-holder Dispersion : 0 681 343 009 assembly HIGHEST RATED SPEED Opening pressure, bar : 172...175 1st version Control-lever position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20 Test inj. tubing : 1 680 750 014 1/min : 0...2500 1/min : 2950 Speed Outside diameter 4th speed C-rod trav.mm : 0.00...1.00 x Wall thickness : 6.00x2.00x600 x Length mm SET IDLE CONTROL-LEVER POSITION (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 1/min : 1000 Speed Contr.-rod trav.mm: 0,90...1,00 per values _____ LOWEST RATED SPEED I Control-lever START OF DELIVERY Test pressure, bar: 30...32 position degrees: 13...17 Setting point w/out aux. spring Speed 1/min: 375 Contr.-rod trav.mm: 5.5 : 2.00...2.10 Prestroke mm : (1.95...2.15)
Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1- 3- 4- 2 Testing:

Speed 1/min : 250 C-rod trav.mm min: 11.50 Speed 1/min: 375 : 5.40...5.60 C-rod trav.mm : 1.50 C-rod travamm Speed 1/min: 630...730 1/min : 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING Speed 1/min: 400 Contr.-rod trav.mm: 4,40...4,60 : (4,30...4,70) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min: 1000 : 11.10...11.20 C-rod trav.mm 2nd speed 1/min : 1800 C-rod trav.mm : 10.80...11.00 3rd speed 1/min : 2200 C-rod trav.mm : 10.30...10.50 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H:: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.0...35.0 1000H.: (32.0...36.0) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/ : 55.0...0.0 1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50 Dispersion 1000H.: (3,00) LOW IDLE Speed 1/min: 375 Contr.-rod trav_mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed 1/min: 425 Contr.-rod trav.mm: (7,00...8,60) Del.quantity cm3/: (13,00...21,00) 1000H.: -

Vacuum hPa: 0,40

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.00 (1.00) Test sheet : MB 2,4 V1 : 09.03.87 Edition Superceeded BASIC SETTING Calibrating oil : ISO-4113 1st speed 1/mi: 1000 : 0 400 074 921 Combination no. Contra-rod trav.mm: 13.00...13.10 Injection pump Pump designation : PES4M55C32ORS107-2 EP type number : 0 410 054 962 Del.quantity cm3/: 3.7...3.8 100H.: (3.6...3.9) Governor Governor design. : RSF375/2250M17 Governer no. : 0 420 021 016 Dispersion cm3/:0.2100H.: (0.3) Customer-spec. information Customer : DB 1/min: 375.0 2nd speed Contr.-rod trav. m: 6.1...6.3 Del.quantity cm3/: 0.6...0.7 100H.: (0.5...0.9) : 0M616 (2.4 L) Engine 1st version kW : 53.0 cm3/:0.1Dispersion TEST BENCH REQUIREMENTS 100H.: (0.1) Calibrating-oil inlet temp. OC FULL-LOAD DELIV. AT FULL-LOAD STOP : 38...42 1st version Speed 1/min: 1000 Del.quantity cm3/: 37.5...38.5 Overflow valve : 1 417 413 012 1000H.: (36.5...39.5) cm3/ : 2.50 Inlet press., bar: 1.00 Dispersion 1000Ha: (3.00) Calibrating nozzle-holder : 0 681 343 009 assembly HIGHEST RATED SPEED 1st version Control-lever Opening pressure, bar : 172...175 position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20 1/min : 0...2500 Speed Test inj. tubing : 1 680 750 014 4th speed 1/min: 2950 C-rod trav.mm : 0.00...1.00 Outside diameter x Wall thickness SET IDLE CONTROL-LEVER x Length mm : 6.00X2.00X600 POSITION Speed 1/min : 1000 Contr.-rod trav.mm: 1,40...1,50 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. LOWEST RATED SPEED I per values Control-lever position degrees: 9...13 Setting point w/out aux. spring Speed 1/min: 375 START OF DELIVERY Test pressure, bar: 30...32 Contr.-rod trav.mm: 6.2 Prestroke mm : 2.20...2.30 : (2.15...2.35) Testina: Contr.-rod trav.mm: 20.00...0.00 1/min : 250 Speed C-rod trav.mm min : 10.50 Cam sequence : 1- 3- 4- 2

1/min : 375 Speed C-rod trav.mm : 6.10...6.30 C-rod trav.mm : 2.00 Speed 1/min : 720...820 1/min : 1000 Speed C-rod trav.mm max: 1.50 SET IDLE AUXILIARY SPRING 1/min : 450 Speed Contr.-rod trav.mm: 4,90...5,10 : (4,80...5,20) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed C-rod trav.mm : 13.00...13.10 2nd speed 1/min : 1800 C-rod trav.mm : 12.00...12.20 3rd speed 1/min : 2200 C-rod tray.mm : 11.70...11.90 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 1800 Del.quantity cm3/: 37.5...39.5 1000H:: (36.5...40.5) cm3/: 2.50 1000H.: (3.00) Dispersion 1/min : 2200 Speed Del.quantity cm3/: 37.5...39.5 1000H: (36.5...40.5) Dispersion cm3/: 2.50 1000H:: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 53.0...0.0 1000H:: (53.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min : 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 20.0...24.0 1000H.: (19.0...25.0) Dispersion cm3/: 2.50 1000H.: (3.00) LOW IDLE Speed 1/min : 375 Contr.-rod trav.mm: 6.10...6.30 Del.quantity cm3/: 6.0...7.0 1000H:: (5.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50)

Remarks:

J06

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 375 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.00 (1.00) Test sheet : MB 2,4 V2 : 09.03.87 Edition Superceeded BASIC SETTING Calibrating oil : ISO-4113 1st speed 1/mi: 1000 Combination no. : 0 400 074 922 Contr.-rod trav.mm: 13.00...13.10 Injection pump Pump designation : PES4M55C32ORS107-2 Del.quantity cm3/ : 3.7...3.8 EP type number : 0 410 054 962 100H.: (3.6...3.9) Governor Governor design. : RSF375/2250M18 Governer no. : 0 420 021 017 Dispersion cm3/:0.2100H.: (0.3) Customer-spec. information Customer : DB 2nd speed 1/min: 375.0 Contr.-rod trav. m: 6.1...6.3 Del.quantity cm3/: 0.6...0.7 100H:: (0.5...0.9) Engine : 0M616 (2.4 L) 1st version kW : 53.0 cm3/:0.1Dispersion 100H.: (0.1) TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C FULL-LOAD DELIV. AT FULL-LOAD STOP : 38...42 1st version Speed 1/min: 1000
Del.quantity cm3/: 37.5...38.5
1000H: (36.5...39.5)
Dispersion cm3/: 2.50 Overflow valve : 1 417 413 012 Inlet press., bar : 1.00 1000H.: (3.00) Calibrating nozzle-holder : 0 681 343 009 HIGHEST RATED SPEED assembly 1st version Opening Control-lever position degrees: 50...0

3rd c-rod trav.mm: 7,80...8,20

Speed 1/min: 0...2500

4th speed 1/min: 2950 pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 C-rod trav.mm : 0.00...1.00 Outside diameter SET IDLE CONTROL-LEVER POSITION x Wall thickness x Length mm : 6.00x2.00x600 1/min : 1000 (A) Injection pump setting values Contr.-rod trav.mm: 1,40...1,50 Insp. values in parentheses Set constant delivery quant. LOWEST RATED SPEED I per values Control-lever position degrees: 9...13 Setting point w/out aux. spring Speed 1/min: 375 START OF DELIVERY Test pressure, bar: 30...32 Contr.-rod trav.mm: 6.2 : 2.20...2.30 Prestroke mm : (2.15...2.35) Testing: Contr.-rod trav.mm: 20.00...0.00 1/min : 250 Speed Cam sequence : 1- 3- 4- 2 C-rod trav.mm min: 10.50

1/min : 375 Speed C-rod trav.mm : 6.10...6.30 C-rod trav.mm : 2.00 Speed 1/min : 720...820 1/min: 1000 Speed C-rod trav.mm max: 1.50 SET IDLE AUXILIARY SPRING 1/min : 450 Speed Contr.-rod trav.mm: 4,90...5,10 : (4,80...5,20) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 C-rod trav.mm : 13.00...13.10 2nd speed 1/min : 1800 C-rod trav.mm : 12.00...12.20 3rd speed 1/min : 2200 C-rod trav.mm : 11.70...11.90 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 37.5...39.5 1000H: (36.5...40.5)
Dispersion cm3/: 2.50
1000H: (3.00)
Speed 1/min: 2200
Del.quantity cm3/: 37.5...39.5 1000H.: (36.5...40.5) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 53.0...0.0 1000H.: (53.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 20.0...24.0 1000H.: (19.0...25.0) cm3/: 2.50 1000H.: (3.00) Dispersion LOW IDLE 1/min : 375 Speed Contr.-rod trav.mm: 6.10...6.30 Del.quantity cm3/: 6.0...7.0 1000H.: (5.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50)

Remarks:

80L

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                         SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00)
Test sheet
                     : MB 2,5 F1
: 30.03.87
Edition
                                                         SD mark cyl. no. : 1
Superceeded
Calibrating oil
                    : ISO-4113
                                                         BASIC SETTING
                     : 0 400 075 960
Combination no.
                                                                          1/mi: 1000
                                                          1st speed
Injection pump
                                                         Contr.-rod trav.mm: 11.30...11.40
Pump designation : PES5M55C32ORS153
EP type number
                    : 0 410 055 991
                                                         Del.guantity cm3/: 3.1...3.2
Governor
Governor design. : RSF350/2300M67-1
                                                                         100H.: (3.0...3.3)
Governer no.
                    : 0 420 021 098
Customer-spec. information
                                                         Dispersion
                                                                         cm3/:0.2
Customer :
                     : DB
                                                                         100H.: (0.3)
                     : 0M602
Engine
                                                         2nd speed 1/min: 350.0
Contr.-rod trav. m: 5.4...5.6
Del.quantity cm3/: 0.5...0.6
100H.: (0.4...0.9)
1st version kW
                     : 66.0
TEST BENCH REQUIREMENTS
                                                                         cm3/: 0.1
100H.: (0.1)
                                                         Dispersion
Calibrating-oil inlet temp. C
                     : 38...42
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                     : 1 469 990 351
                                                         1st version
                                                         Speed 1/min: 1000
Del.quantity cm3/: 31.5...32.5
1000H.: (30.5...33.5)
Dispersion cm3/: 2.50
1000H.: (3.00)
Inlet press., bar : 1.00
Calibrating nozzle-holder
             : 0 681 343 009
 assembly
                                                         HIGHEST RATED SPEED
Opening
 pressure, bar : 172...175
                                                         1st version
                                                         Control-lever
                                                         position degrees: 50...0

3rd c-rod trav.mm: 7,80...8,20
Test inj. tubing : 1 680 750 014
                                                         Speed 1/min: 0...2500
4th speed 1/min: 2950
Outside diameter
x Wall thickness
                                                           C-rod tray.mm : 0.00...1.00
x Length mm
                     : 6.00x2.00x600
                                                         SET IDLE CONTROL-LEVER
                                                         POSITION
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                       1/min: 1000
                                                         Contr.-rod trav.mm: 0,90...1,00
    per values
                                                         LOWEST RATED SPEED I
START OF DELIVERY
                                                         Control-lever
                                                          position degrees: 13...17
Test pressure, bar: 30...32
                                                         Setting point w/out aux. spring Speed 1/min: 350
Prestroke mm
                     : 2.00...2.10
                                                         Contr.-rod trav.mm: 5.5
                     : (1.95...2.15)
Contr.-rod trav.mm: 20.00...22.00
                    : 1- 2- 4- 5- 3
Cam sequence
                                                         Testing:
```

Speed 1/min : 220 C-rod trav.mm min: 10.00 1/min : 350 Speed : 5.40...5.60 C-rod trav.mm : 1.50 C-rod trav.mm 1/min : 640...740 1/min : 1000 Speed Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING 1/min : 400 Speed Contra-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 C-rod trav.mm : 11.30...11.40 2nd speed 1/min: 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 1800
Del.quantity cm3/: 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/: 2.50
1000H.: (3.00)
Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H:: (32.5...36.5) Dispersion cm3/: 2.50 1000H:: 3.00 STARTING FUEL DELIVERY 1/min : 100Speed Del.quantity cm3/ : 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE 1/min: 2500 Speed Contr.-rod trav.mm: 7.80...8.20
Del.quantity cm3/: 22.0...26.0
1000H.: (21.0...27.0)
Dispersion cm3/: 2.50 1000H.: (3.00) LOW IDLE Speed 1/min: 350 Ccntr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) cm3/: 1.00 Dispersion 1000H.: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed 1/min: 400 Contr.-rod trav.mm: (5,20...6,80) Del.quantity cm3/: (5,00...13,00) 1000H.: -

Vacuum hPa : 0,40

Remarks:
SETTING OF FBG
-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00) Test sheet : MB 2.5 F : 30.03.87 Edition Superceeded SD mark cyl. no. : 1 Calibrating oil : ISO-4113 BASIC SETTING Combination no. : 0 400 075 961 1st speed 1/mi: 1000 Injection pump Contr.-rod trav.mm: 11.30...11.40 Pump designation : PES5M55C32ORS153 EP type number : 0 410 055 991 Del.quantity cm3/: 3.1...3.2 Governor Governor design. : RSF350/2300M67 Governer no. : 0 420 021 094 100H.: (3.0...3.3) cm3/:0.2Customer-spec. information Dispersion Customer : DB 100H.: (0.3) : 0M602 Engine 1/min: 350.0 2nd speed Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/: 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/: 0.1

100H.: (0.1) 1st version kW : 66.0 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version Speed 1/min: 1000
Del.quantity cm3/: 31.5...32.5
1000H.: (30.5...33.5)
Dispersion cm3/: 2.50
1000H.: (3.00) Inlet press., bar : 1.00 Calibrating nozzle-holder : 0 681 343 009 assembly HIGHEST RATED SPEED Opening. pressure, bar : 172...175 1st version Control-lever position degrees: 50...0
2nd c-rod trav.mm: 7.80
Speed 1/min: 0...2500
4th speed 1/min: 2950 Test inj. tubing : 1 680 750 014 Outside diameter C-rod trav.mm : 0.00...1.00 x Wall thickness : 6.00x2.00x600 x Length mm SET IDLE CONTROL-LEVER (A) Injection pump setting values POSITION Insp. values in parentheses Set constant delivery quant. 1/min : 1000 Speed Contr.-rod trav.mm: 0,9...1,0 per values LOWEST RATED SPEED I Control-lever START OF DELIVERY Test pressure, bar: 30...32 position degrees: 13...17 Setting point w/out aux. spring : 2.00...2.10 1/min : 350 Prestroke mm : (1.95...2.15) Contr.-rod trav.mm: 5.5 Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1- 2- 4- 5- 3 Testing:

Speed 1/min : 220 C-rod trav.mm min : 10.00 1/min : 350 .mm : 5.40...5.60 .mm : 1.50 Speed C-rod trav.mm C-rod trav.mm Speed 1/min: 640...740 1/min : 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING 1/min: 400 Speed Contr.-rod trav.mm: 4.00...4.40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed : 11.30...11.40 C-rod trav.mm 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0)
Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50 1000H.: (3.00) Dispersion LOW IDLE 1/min : 350 Speed Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed 1/min: 400 Contr.-rod trav.mm: (5,2...6,8) Del.quantity cm3/: -1000H.: (5,0...13,0)

Vacuum hPa : 0,4

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00) : MB 2,5 F2 Test sheet : 07.11.86 Edition Superceeded SD mark cyl. no. : 1 Calibrating oil : ISO-4113 BASIC SETTING : 0 400 075 964 Combination no. 1st speed 1/mi: 1000 Injection pump Pump designation : PES5M55C32ORS162 Contr.-rod trav.mm: 11.30...11.40 EP type number : 0 410 055 983 Del.quantity cm3/: 3.1...3.2 Governor Governor design. : RSF349/2300M60-15 100H.: (3.0...3.3) Governer no. : 0 420 021 081 Customer-spec. information Dispersion cm3/:0.2Customer : DB 100H.: (0.3) : 0M602-LVP MJ:86 Engine 1/min: 315.0 2nd speed Contr.-rod trav. m: 5.2...5.4

Del.quantity cm3/: 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/: 0.1

100H.: (0.1) 1st version kW : 66.0 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version 1/min: 1000 Speed Del.quantity cm3/: 31.0...32.0 1000H.: (30.0...33.0) Dispersion cm3/: 2.50 1000H.: (3.00) Inlet press., bar : 1.00 Calibrating nozzle-holder : 0 681 343 009 assembly HIGHEST RATED SPEED Openina pressure, bar : 172...175 1st version Control-lever position degrees: 50...0

3rd c-rod trav.mm: 7,10...7,50
Speed 1/min: 0...2500

4th speed 1/min: 2950 Test inj. tubing : 1 680 750 014 Outside diameter C-rod trav.mm : 0.00...1.00 x Wall thickness : 6.00x2.00x600 x Length mm SET IDLE CONTROL-LEVER POSITION (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 1/min : 1000 Speed Centr.-rod trav.mm: 1,90...2,00 per values LOWEST RATED SPEED I Control-lever START OF DELIVERY Test pressure, bar: 30...32 position degrees: 13...17 Setting point w/out aux. spring 1/min : 315 : 1.70...1.80 Prestroke mm : (1.65...1.85) Contr.-rod trav.mm: 20.00...22.00 Contr.-rod trav.mm: 5.3 Cam sequence : 1- 2- 4- 5-Testing:

Speed 1/min: 220 C-rod trav.mm min: 7.50 Speed 1/min: 315 HIGH IDLE 1/min: 2500 Speed : 5.20...5.40 C-rod trav.mm Contr.-rod trav.mm: 7.10...7.50 Del.quantity cm3/: 16.0...20.0 1000H.: (15.0...21.0) : 2.50 C-rod tray.mm 1/min : 530...630 Speed cm3/ 2.50 1000H.: (3.00) Speed 1/min : 1000 Dispersion C-rod trav.mm max: 2.00 SET IDLE AUXILIARY SPRING LOW IDLE Speed 1/min : 380 Contr.-rod trav.mm: 3,90...4,10 : (3,80...4,20) 1/min : 315 Speed Contr.-rod trav.mm: 5.20...5.40 Del.quantity cm3/: 5.0...6.0 1,000H.: (4.5...9.0) TORQUE CONTROL cm3/: 1.00 Torque-control curve - 1st version Dispersion 1st speed 1/min : 1000 1000H.: (1.50) : 11.30...11.40 C-rod trav.mm 2nd speed 1/min: 1600 C-rod trav.mm: 10.90...11.10 3rd speed 1/min: 2250 SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) C-rod trav.mm : 10.30...10.50 Control lever at idle stop 1/min : 340 Speed Contr.-rod trav.mm: (12,5...13,9) compensator (LDA_ADA_ALDA) Del.quantity cm3/: (33,0...41,0) 1000H.: -Electric current A: 1,8 1st version Control lever at full-load stop Speed 1/min: 2950 Setting Speed 1/min: 1000 Pressure hPa: 930 Contr.-rod trav.mm: 0...1.0 Contr.-rod trav.mm: 0.10...0.50 Electric current short-duration A: 3,0 Measurement Starting test 1/min : 1000 Speed Speed 1/min : 100 Del.quantity cm3/: - min. 1000H.: 55,0 1st pressure hPa : 840 C-rod trav.mm : 1.10...1.30 2nd pressure hPa : 700 Remarks: Start-of-delivery spacing (difference) between max/min value 10 cam angle C-rod trav.mm : 2.30...2.70 FUEL-DELIVERY CHARACTERISTICS maximum. 1/min : 1600 Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2250 Del.quantity cm3/: 32.0...34.0 CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction 1000H.: (31.0...35.0) cm3/: 2.50 Dispersion allowable after switchover point (of starting cam) up to 1000 1/min. 1000H.: 3.00 Control-lever position 46.5°, control-rod travel deduction must be STARTING FUEL DELIVERY greater than 0.2 mm after switchover point (of starting cam). Speed 1/min : 100 Del.quantity cm3/ : 55.0...0.0 TESTING PNEUMATIC SHUTOFF DEVICE 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 -Control lever at idle stop. With n = 315 1/min. and pu = 450 mbar. J14

control rod must move quickly to
control-rod travel = 0 mm

START-OF-DELIVERY ADJUSTMENT
-Start-of delivery adjustment and lock after start-of-delivery mean value of all cylinders, 17.3...17.70 (17.2...17.80) angular displacement of the cam after cylinder 1.

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BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                         SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00)
                     : MB 2,5 F4
: 05.11.86
Test sheet
Edition
Superceeded
                                                          SD mark cyl. no. : 1
Calibrating oil
                     : ISO-4113
                                                          BASIC SETTING
                     : 0 400 075 968
Combination no.
                                                                          1/mi: 1000
                                                          1st speed
Injection pump
Pump designation : PES5M55C32ORS153
                                                          Contr.-rod trav.mm: 11.30...11.40
EP type number
                     : 0 410 055 991
                                                          Del.quantity cm3/ : 3.1...3.2
Governor
Governor design. : RSF340/2300M59-14
                     : 0 420 021 074
                                                                         100H.: (3.0...3.3)
Governer no.
Customer-spec. information
                                                          Dispersion
                                                                         cm3/:0.2
Customer
                     : DB
                                                                         100H.: (0.3)
Engine
                     : 0M602
                                                         2nd speed 1/min: 315.0
Contr.-rod trav. m: 5.4...5.6
Del.quantity cm3/: 0.5...0.6
1st version kW
                     : 66.0
                                                                         100H: (0.4..0.9)
cm3/: 0.1
100H: (0.1)
TEST BENCH REQUIREMENTS
                                                          Dispersion
Calibrating-oil inlet temp. OC
                     : 38...42
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                     : 1 469 990 351
                                                          1st version
                                                          Speed
                                                                         1/min: 1000
Inlet press., bar: 1.00
                                                         Del.quantity cm3/: 31.5...32.5
                                                                       1000H:: (30.5...33.5)
cm3/: 2.50
1000H:: (3.00)
Calibrating nozzle-holder
                                                         Dispersion
              : 0 681 343 009
 assembly
                                                         HIGHEST RATED SPEED
Opening
 pressure, bar : 172...175
                                                         1st version
                                                         Control-lever
                                                         position degrees: 50...0

3rd c-rod trav.mm: 7.80...8,20

Speed 1/min: 2500

4th speed 1/min: 2950
Test inj. tubing : 1 680 750 014
Outside diameter
                                                            C-rod trav.mm : 0.00...1.00
x Wall thickness
                     : 6.00X2.00X600
x Length mm
                                                         SET IDLE CONTROL-LEVER
                                                         POSITION
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                        1/min : 1000
                                                         Speed
                                                         Contr.-rod trav.mm: 0,9...1.0
    per values ____
                                                         LOWEST RATED SPEED I
                                                         Control-lever
START OF DELIVERY
                                                          position degrees: 13...17
Test pressure, bar: 30...32
                                                         Setting point w/out aux. spring
Prestroke mm : 2.00...2.10 : (1.95...2.15)
Contr.-rod trav.mm: 20.00...22.00
                                                                      1/min : 315
                                                         Contr.-rod trav.mm: 5.5
                                         3
Cam sequence : 1- 2- 4- 5-
                                                         Testing:
J16
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Speed 1/min : 220 C-rod trav.mm min: 8.00 1/min : 315 mm : 5.40...5.60 Speed C-rod trav.mm : 1.50 C-rod trav.mm Speed Speed 1/min: 630...730 1/min : 1000 C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING 1/min : 380 Speed Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 C-rod trav.mm : 11.30...11.40
2nd speed 1/min : 1800
C-rod trav.mm : 10.90...11.10
3rd speed 1/min : 2200
C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 1800
Del.quantity cm3/: 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/: 2.50
1000H.: (3.00)
Speed 1/min: 2200
Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H: (21.0...27.0) cm3/: 2.50 1000H: (3.00) Dispersion LOW IDLE Speed 1/min: 315 Contr.-rod trav.mm: 5.40...5.60 Speed Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE
REGULATION (ELR)

Control lever at idle stop
Speed 1/min: 340
Control trav.mm: (12,6...14,0)
Del.quantity cm3/:1000H.: (33,0...41,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min: 2950
Control trav.mm: 0,0...1,0
Electric current
short-duration A: 3,0
Starting test
Speed 1/min: 100

Del.quantity cm3/: - min. 1000H.: 55,0

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.80). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00) : MB 2,5 F5 Test sheet : 05.11.86 Edition Superceeded SD mark cyl. no. : 1 Calibrating oil : ISO-4113 BASIC SETTING : 0 400 075 969 Combination no. 1st speed 1/mi: 1000 Injection pump : PES5M55C320RS153 Contr.-rod trav.mm: 11.30...11.40 Pump designation EP type number : 0 410 055 991 Del.quantity cm3/: 3.1...3.2 Governor Governor design. : RSF350/2300M55-16 : 0 420 021 070 Governer no. 100H.: (3.0...3.3) Customer-spec. information cm3/:0.2Dispersion : DB Customer 100H.: (0.3) Engine : 0M602 2nd speed 1/min: 350.0 Contr.-rod trav. m: 5.4...5.6 1st version kW : 66.0 Del.quantity cm3/: 0.5...0.6 100H.: (0.4...0.9) TEST BENCH REQUIREMENTS cm3/:0.1Dispersion Calibrating-oil inlet temp. OC 100H.: (0.1) : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version Speed 1/min: 1000 Del.quantity cm3/: 31.5...32.5 Inlet press., bar : 1.00 1000H.: (30.5...33.5) cm3/ : 2.50 Calibrating nozzle-holder Dispersion : 0 681 343 009 1000H.: (3.00) assembly Opening HIGHEST RATED SPEED pressure, bar : 172...175 1st version Control-lever position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20 Test inj. tubing : 1 680 750 014 1/min : 2500 Speed Outside diameter 4th speed 1/min : 2950 x Wall thickness C-rod trav.mm : 0.00...1.00 : 6.00X2.00X600 x Length mm SET IDLE CONTROL-LEVER **POSITION** (A) Injection pump setting values Insp. values in parentheses 1/min : 1000 Set constant delivery quant. Contr.-rod trav.mm: 0,9...1,0 per values ____ LOWEST RATED SPEED I START OF DELIVERY Control-lever Test pressure, bar: 30...32 position degrees: 13...17 Setting point w/out aux. spring : 2.00...2.10 : (1.95...2.15) 1/min : 350 Prestroke mm Contr.-rod tray.mm: 5.5 Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1- 2- 4- 5- 3 Testing:

Speed 1/min : 220 C-rod trav.mm min: 10.00 Speed 1/min: 350 C-rod trav.mm: 5.40...5.60 C-rod trav.mm: 1.50 Speed 1/min: 640...740 1/min: 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING Speed 1/min: 400 Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed : 11.30...11.40 C-rod trav.mm 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS 1/min: 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H:: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50 Dispersion 1000H.: (3.00) LOW IDLE Speed 1/min: 350 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) cm3/: 1.00 Dispersion 1000H.: (1.50) J19

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed 1/min: 400 Contrared trav.mm: 5,2...6,8 Del.quartity cm3/: -1000H: (5,0...13,0)

Vacuum hPa : 0,40

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

1	
BOSCH INJ. PUMP TEST SPECIFICATIONS	
Note inst. in remarks column	SD and coapine ⁰ CS: 0-72-1//-216-288
Test sheet : MB 2,5 G Edition : 05.11.86	SD ang. spacing ⁰ CS: 0-72-144-216-288 Tolerance + - 0.00 (1.00)
Test sheet : MB 2.5 G Edition : 05.11.86 Superceeded : - Calibrating oil : ISO-4113	SD mark cyl. no. : 1
Combination no. : 0 400 075 970	BASIC SETTING
Injection pump	1st speed
Pump designation : PES5M55C32ORS153 EP type number : 0 410 055 991	Contrrod trav.mm: 11.3011.40
Governon	Del.quantity cm3/: 3.13.2
Governor design.: RSF350/2300M55-13 Governer no.: 0 420 021 067	100H.: (3.03.3)
Customer-spec. information Customer : DB	Dispersion cm3/: 0.2
Engine : 0M602	100H.: (0.3)
1st version kW : 66.0	2nd speed 1/min: 350.0
TEST BENCH REQUIREMENTS	Contrrod trav. m: 5.45.6 Del.quantity cm3/: 0.50.6 100H.: (0.40.9)
1	Dispersion cm3/: 0.1 100H.: (0.1)
Calibrating-oil 1 inlet temp. °C : 3842	FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve : 1 469 990 351	1st version
Inlet press., bar : 1.00	Speed 1/min: 1000
Calibrating nozzle-holder 1 assembly : 0 681 343 009	Del.quantity cm3/: 31.532.5 1000H.: (30.533.5) Dispersion cm3/: 2.50 1000H.: (3.00)
1	
Opening	HIGHEST RATED SPEED 1st version Control-lever
Test inj. tubing : 1 680 750 014	position degrees: 500 3rd c-rod trav.mm: 7,808,20
Outside diameter	Speed 1/min: 2500 4th speed 1/min: 2950
x Wall thickness Length mm : 6.00x2.00x600	C-rod trav.mm : 0.001.00
(A) Injection pump setting values	SET IDLE CONTROL-LEVER POSITION
Insp. values in parentheses Set constant delivery quant.	Speed 1/min: 1000 Contrrod trav.mm: 0,91,0
per values	LOWEST RATED SPEED I
START OF DELIVERY Test pressure, bar: 3032	Control-lever position degrees: 1317
Prestroke mm : 2.002.10	Setting point w/out aux. spring Speed 1/min : 350
: (1.952.15) Contrrod trav.mm: 20.0022.00	Contrrod trav.mm: 5.5
Cam sequence : 1- 2- 4- 5- 3	Testing:
J20	

1/min : 220 Speed C-rod trav.mm min: 10.00 Speed 1/min: 350 C-rod trav.mm: 5.40...5.60 C-rod trav.mm: 1.50 Speed 1/min: 640...740 1/min : 1000 Speed C-rod tray.mm max : 1.00 SET IDLE AUXILIARY SPRING Speed 1/min : 400 Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 : 11.30...11.40 C-rod trav.mm 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 1800 Del.quantity cm3/: 34.0...35.5 1000H:: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) cm3/: 2.50Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50Dispersion 1000H.: (3.00) LOW IDLE Speed 1/min: 350 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000H.: (4.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

Speed 1/min: 400 Contr.-rod trav.mm: (5,2...6,8) Del.quantity cm3/: -1000H.: (5,0...13,0)

Vacuum hPa : 0,40

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00) Test sheet : MB 3,0 W6 Edition : 09.03.87 Superceeded BASIC SETTING : ISO-4113 Calibrating oil 1/mi: 1000 1st speed Combination no. : 0 400 075 971 Contra-rod trav.mm: 13.00...13.10 Injection pump Pump designation : PESSM55C32ORS108-3 Del.quantity cm3/: 3.7...3.8 EP type number : 0 410 055 982 Governor 100H.: (3.6...3.9) Governor design. : RSF350/2300M16 Governér no. : 0 420 021 015 Dispersion cm3/:0.2100H.: (0.3) Customer-spec. information Customer : DB 2nd speed 1/min: 350.0 Contr.-rod trav. m: 6.1...6.3 : 0M617 (3.0 L) Engine Del.quantity cm3/: 0.6...0.7 100H: (0.5...0.9) Dispersion cm3/: 0.1 100H: (0.1) 1st version kW : 65.0 TEST BENCH REQUIREMENTS FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating-oil inlet temp. OC : 38...42 1st version Speed 1/min: 1000
Del.quantity cm3/: 37.5...38.5
1000H.: (36.5...39.5)
Dispersion cm3/: 2.50 Overflow valve : 1 417 413 012 Inlet press., bar : 1.00 1000H.: (3.00) Calibrating nozzle-holder : 0 681 343 009 HIGHEST RATED SPEED assembly 1st version Control-lever Opening pressure, bar : 172...175 position degrees: 50...0

3rd c-rod trav.mm: 7.80...8,20
Speed 1/min: 2500 Test inj. tubing : 1 680 750 014 1/min : 2950 4th speed C-rod trav.mm : 0.00...1.00 Outside diameter x Wall thickness SET IDLE CONTROL-LEVER x Length mm : 6.00x2.00x600 POSITION 1/min : 1000 Speed (A) Injection pump setting values Contra-rod trav.mm: 1,4...1,5 Insp. values in parentheses Set constant delivery quant. LOWEST RATED SPEED I per values ____ Control-lever position degrees: 9...13 START OF DELIVERY Setting point w/out aux. spring 1/min : 350 Test pressure, bar: 30...32 Speed Contr.-rod trav.mm: 6.2 : 2.20...2.30 Prestroke mm : (2.15.,.2.35) Testing: Contr.-rod trav.mm: 20.00...0.00 Cam sequence : 1- 2- 4- 5- 3 1/min : 250 Spæed C-rod trav.mm min: 9.50

Speed 1/min : 350 C-rod trav.mm : 6.10...6.30 mm : 2.00 1/min : 720...820 C-rod trav.mm Speed 1/min : 1000 Speed C-rod trav.mm max: 1.50 SET IDLE AUXILIARY SPRING Speed 1/min : 450 Contr.-rod trav.mm: 4,70...4,90 : (4,60...5,00) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 : 13.00...13.10 C-rod trav.mm 2nd speed 1/min: 1800 C-rod trav.mm: 12.00...12.20 3rd speed 1/min: 2200 C-rod trav.mm : 11.70...11.90 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 37.5...39.5 1000H.: (36.5...40.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 37.5...39.5 1000H.: (36.5...40.5) cm3/: 2.50 Dispersion 1000H.: 3.00 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/ : 53.0...0.0 1000H.: (53.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 20.0...24.0 1000H:: (19.0...25.0) Dispersion cm3/: 2.50 1000H.: (3.00) LOW IDLE 1/min : 350 Speed Contr.-rod trav.mm: 6.10...6.30 Del.quantity cm3/: 6.0...7.0 1000H.: (5.5...9.0) cm3/: 1.00 1000H.: (1.50) Dispersion

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/m n...450 1/min.

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS	
Note inst. in remarks column	
Test sheet : MB 3.0 W7	SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.00 (1.00)
Test sheet : MB 3.0 W7 Edition : 09.03.87 Superceeded : - Calibrating oil : ISO-4113	BASIC SETTING
Combination no. : 0 400 075 972	1 1st speed 1/mi: 1000
Injection of the	Contrrod trav.mm: 13.0013.10
Pump designation : PES5M55C32ORS108-3 EP type number : 0 410 055 982	Del.quantity cm3/: 3.73.8
Leovernor	100H.: (3.63.9)
Governor design. : RSF350/2300M15 Governer no. : 0 420 021 014	I Dispersion cm3/: 0.2
Customer-spec. information Customer : DB	100H.: (0.3)
Engine : 0M617 (3.0 L)	l 2nd speed 1/min: 350.0 Contrrod tray. m: 6.16.3
1st version kW : 65.0	Contrrod trav. m: 6.16.3 Del.quantity cm3/: 0.60.7 1 100H.: (0.50.9)
TEST BENCH REQUIREMENTS	Dispersion cm3/: 0.1 1 100H.: (0.1)
	I FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating-oil inlet temp. C : 3842	I 1st version
Overflow valve : 1 417 413 012	1 Speed 1/min: 1000
Inlet press., bar : 1.00	Del.quantity cm3/: 37.538.5 1 1000H.: (36.539.5) 1 Dispersion cm3/: 2.50 1 1000H.: (3.00)
Calibrating nozzle-holder	
assembly : 0 681 343 009	HIGHEST RATED SPEED I 1st version
Opening 172175	Control-lever position degrees: 500 3rd c-rod trav.mm : 7,808,20
Test inj. tubing : 1 680 750 014	Speed 1/min : 2500 4th speed 1/min : 2950 C-rod trav.mm : 0.001.00
Outside diameter x Wall thickness	SET IDLE CONTROL-LEVER
x Length mm : 6.00x2.00x600	POSITION Speed 1/min: 1000
(A) Injection pump setting values Insp. values in parentheses	Contrrod trav.mm: 1,41,5
Set constant delivery quant. per values	LOWEST RATED SPEED I Control-lever
START OF DELIVERY Test pressure, bar: 3032	I position degrees: 913 I Setting point w/out aux. spring I Speed 1/min : 350 I Contrrod trav.mm: 6.2
Prestroke mms : 2,202.30 : (2.152.35)	Testing:
Contrrod trav.mm: 20.000.00 Cam sequence : 1-2-4-5-3	Speed 1/min: 250 C-rod trav.mm min: 9.50

1/min : 350 Speed C-rod trav.mm : 6.10...6.30 C-rod trav.mm : 2.00 Speed 1/min: 720...820 1/min : 1000 Speed C-rod trav.mm max: 1.50 SET IDLE AUXILIARY SPRING Speed 1/min : 450 Contr.-rod trav.mm: 4,79...4,90 (4,60...5,00) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed : 13.00...13.10 C-rod trav.mm 2nd speed 1/min : 1800 C-rod trav.mm : 12.00...12.20 3rd speed 1/min : 2200 C-rod trav.mm : 11.70...11.90 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 37.5...39.5 1000H.: (36.5...40.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 37.5...39.5 1000H.: (36.5...40.5) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 53.0...0.0 1000H.: (53.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 20.0...24.0 1000H.: (19.0...25.0) cm3/: 2.50Dispersion 1000H.: (3.00) LOW IDLE 1/min : 350 Speed Contr.-rod trav.mm: 6.10...6.30 Del.quantity cm3/: 6.0...7.0 1000H.: (5.5...9.0) cm3/: 1.00Dispersion 1000H.: (1.50)

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-72-144-216-288 Tolerance + - : 0.50 (0.75) : MB 3,0 W8 Test sheet Edition : 12.09.86 BASIC SETTING Superceeded Calibrating oil : ISO-4113 1/mi: 1650 1st speed Combination no. : 0 400 075 973 Contr.-rod trav.mm: 11.90...12.00 Injection pump Pump designation : PESSM55C320RS108-2 Del.quantity cm3/: 3.5...3.6 EP type number : 0 410 055 984 100H.: (3.4...3.7) Governor Governor design. : RSF350/1700M18-3 Governer no. : 0 420 021 061 cm3/:0.2Dispersion 100H.: (0.3) Customer-spec. information Customer : DB 2nd speed 1/min: 350.0 Contr.-rod trav. m: 6.0...6.2 Del.quantity cm3/: 0.6...0.7 100H.: (0.5...0.9) : 0M617 (3.0 L) Engine : 54.0 1st version kW cm3/: 0.1 100H.: (0.1) Dispersion TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC FULL-LOAD DELIV. AT FULL-LOAD STOP : 38...42 1st version Speed 1/min: 1650 Del-quantity cm3/: 35.5...36.5 Overflow valve : 1 417 413 012 1000H.: (34.5...37.5) cm3/ : 2.50 Inlet press., bar : 1.00 Dispersion 1000H.: (3.00) Calibrating nozzle-holder : 0 681 343 009 assembly HIGHEST RATED SPEED 1st version Control-lever Opening position degrees: 50...0 pressure, bar : 172...175 3rd c-rod trav.mm : 6,80...7,20 1/min : 1900 Speed 1/min : 2350 Test in i. tubing : 1 680 750 014 4th speed C-red trav.mm : 0.00...1_00 Outside diameter x Wall thickness SET IDLE CONTROL-LEVER x Length mm : 6.00X2.00X600 POSITION 1/min : 600 Contr.-rod trav.mm: 1,4...1,5 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. LOWEST RATED SPEED I per values Control-lever position degrees: 10...14 Setting point w/out aux. spring START OF DELIVERY Test pressure, bar: 30...32 1/min : 350 Contr.-rod trav.mm: 6.1 : 2.20...2.30 Prestroke mm : (2.15...2.35) Contr.-rod trav.mm: 20.00...22.00 Testing: 1/min : 250 Speed C-rod trav.mm min: 10,00 3 Cam sequence : 1- 2- 4- 5-J26

1/min : 450 Speed : 4.60...4.80 C-rod trav.mm C-rod trav.mm : 2.00 1/min : 700...800 Speed Speed 1/min : 300 C-rod trav.mm max: 9.50 SET IDLE AUXILIARY SPRING Speed 1/min : 450 Contr.-rod trav.mm: 4,60...4,80 : (4,50...4,90) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1650 C-rod trav.mm : 11.90...12.00 2nd speed 1/min : 1200 C-rod trav.mm : 12.10...12.30 3rd speed 1/min: 600 C-rod trav.mm : 12.70...12.90 FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 1200 Del.quantity cm3/: 34.5...36.5 1000H.: (33.5...37.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 600 Del.quantity cm3/: 34.5...36.5 1000H.: (33.5...37.5) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY Speed 1/min : 100 Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min : 1900 Contr.-rod trav.mm: 6.80...7.20 Del.quantity cm3/: 16.0...20.0 1000H:: (15.0...21.0) Dispersion cm3/: 2.50 1000H:: (3.00) LOW IDLE 1/min : 350 Speed Contr.-rod trav.mm: 6.00...6.20 Del.quantity cm3/: 6.0...7.0 1000H.: (5.5...9.0) Dispersion cm3/: 1.00 1000H.: (1.50) Remarks:

CHECKING THE IDLE-SPEED AUXILIARY

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 350 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

SPRING CUTOFF

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BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                      SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
Test sheet
                    : MB 3,0 W9
: 30.03.87
Edition
Superceeded
                                                      SD mark cyl. no. : 1
Calibrating oil : ISO-4113
                                                      BASIC SETTING
Combination no.
                    : 0 400 076 974
                                                                      1/mi: 1000
                                                      1st speed
Injection pump
Pump designation : PES6M55C32ORS156
                                                      Contr.-rod trav.mm: 11.30...11.40
EP type number
                    : 0 410 056 995
                                                      Del. quantity cm3/ : 3.1...3.2
Governor
Governor design.
                    : RSF315/2300M66-1
Governer no.
                                                                     100H.: (3.0...3.3)
                    : 0 420 021 097
                                                                    cm3/:0.2
Customer-spec. information
                                                      Dispersion
Customer
                   : DB
                                                                     100H.: (0.3)
Engine
                    : 0M603-3.0
                                                      2nd speed 1/min: 290.0
Contr.-rod trav. m: 5.4...5.6
Del.quantity cm3/: 0.5...0.6
1st version kW
                    : 80.0
                                                                     100H.: (0.5...0.9)
TEST BENCH REQUIREMENTS
                                                                    cm3/: 0.1
100H.: (0.1)
                                                      Dispersion
Calibrating-oil inlet temp. OC
                    : 38...42
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                    : 1 469 990 351
                                                      1st version
                                                                     1/min: 1000
                                                      Speed
                                                      Del.quantity cm3/: 31.5...32.5
Inlet press., bar : 1.00
                                                                   1000H:: (30.5...33.5)
cm3/: 2.50
Calibrating nozzle-holder
                                                      Dispersion
                  : 0 681 343 009
                                                                    1000H.: (3.00)
 assembly
Opening
                                                      HIGHEST RATED SPEED
pressure, bar : 172...175
                                                      1st version
                                                      Control-lever
                                                       position degrees: 0...50
                                                      3rd c-rod trav.mm: 7,80...8,20
Speed 1/min: 2500
Test inj. tubing : 1 680 750 014
                                                        th speed 1/min : 2950
C-rod trav.mm : 0.00...1.00
Outside diameter
                                                      4th speed
x Wall thickness
                    : 6.00x2.00x600
x Length mm
                                                      SET IDLE CONTROL-LEVER
                                                      POSITION
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                   1/min : 1000
                                                      Speed
                                                      Contr.-rod trav.mm: 0,9...1,0
    per values ____
                                                      LOWEST RATED SPEED I
START OF DELIVERY
                                                      Control-lever
Test pressure, bar: 30...32
                                                       position degrees: 13...17
                                                      Setting point w/out aux. spring
Prestroke mm
                    : 2.00...2.10
                                                                   1/min : 290
                                                      Contra-rod trav.mm: 5.5
                    : (1.95...2.15)
Contr.-rod trav.mm: 20.00...22.00
Cam sequence : 1-5-3-6-2-4
                                                      Testing:
```

1/min : 220 Speed C-rod trav.mm min : 7.00 Speed 1/min : 290 : 5.40...5.60 C-rod trav.mm : 1.50 C-rod trav.mm 1/min : 620...720 Speed 1/min : 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING 1/min : 360 Speed Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed C-rod trav.mm : 11.30...11.40 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd špeed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50Dispersion 1000H.: (3.00) LOW IDLE Speed 1/min: 290 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) cm3/: 1.00Dispersion 1000H.: (1.50)

K01

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) Control lever at idle stop 1/min : 315 Speed Contr.-rod trav.mm: (12,6...14,0) Del.quantity cm3/: (32,0...40,0) 1000H.: -Electric current A: 1,8 Control lever at full-load stop 1/min : 2950 Contr.-rod trav.mm: (0,0...1,0) Electric current short-duration A: 3.0 Starting test 1/min : 100 Speed Del.quantity cm3/: 55,0 min. 1000H.: -Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.8°). Cam angle according to cyl. 1. Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum. CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5° control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)

Control lever at full-load stop. With n= 1000 1/min., I = 2.5 A, control-rod-travel reduction = 2.25...2.55 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : MB 3,0 W10 : 30.03.87

Calibrating oil : ISC-4113

Combination no. : 0 400 076 975

Injection pump

Pump designation : PES6M55C32ORS156 : 0 410 056 995

EP type number Governor

Governor design. : RSF315/2300M66 Governer no. : 0 420 021 066

Customer-spec. information Customer

: 0M603-3.0 Engine

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values ____

START OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1- 5- 3- 6- 2-

Speed 1/min: 220 C-rod trav.mm min: 7.00 Speed 1/min: 290 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00) C-rod trav.mm : 5.40...5.60 C-rod trav.mm : 1.59 1/min : 620...720 Speed Speed 1/min : 1000 SD mark cyl. no. : 1 C-rod trav.mm max: 1.00 BASIC SETTING SET IDLE AUXILIARY SPRING Speed 1/min: 360 Contr.-rod trav.mm: 4,20...4,40 1/mi: 1000 1st speed Contr.-rod trav.mm: 11.30...11.40 : (4,10...4,50) Del.quantity cm3/: 3.1...3.2 TORQUE CONTROL Torque-control curve - 1st version 100H.: (3.0...3.3) 1st speed 1/min : 1000 C-rod trav.mm : 11.30...11.40 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 cm3/: 0.2 Dispersion 100H.: (0.3) 1/min: 290.0 2nd speed Contr.-rod trav. m: 5.4...5.6 Del.quantity cm3/: 0.5...0.6 FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 1800 Speed 1/min: 1800
Del.quantity cm3/: 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/: 2.50
1000H.: (3.00)
Speed 1/min: 2200
Del.quantity cm3/: 33.5...35.5
1000H.: (32.5...36.5)
Dispersion cm3/: 2.50
1000H.: 3.00 100H.: (0.5...0.9) cm3/: 0.1 100H.: (0.1) Dispersion FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version Speed 1/min: 1000 1000H.: 3.00 Del.quantity cm3/: 31.5...32.5 1000H.: (30.5...33.5) cm3/ : 2.50 1000H.: (3.00) Dispersion STARTING FUEL DELIVERY HIGHEST RATED SPEED 1/min : 100 1st version Speed Del.quantity cm3/: 55.0...0.0 Control-lever position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20
Speed 1/min: 2500
4th speed 1/min: 2950 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 1/min : 2950 HIGH IDLE 4th speed Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H: (21.0...27.0) Dispersion cm3/: 2.50 C-rod trav.mm : 0.00...1.00 SET IDLE CONTROL-LEVER POSITION 1/min : 1000 Speed Contr.-rod trav.mm: 0,9...1,0 1000H.: (3.00) LOW IDLE LOWEST RATED SPEED I Control-lever Speed 1/min: 290 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) position degrees: 13...17 Setting point w/out aux. spring 1/min : 290 Contr.-rod trav.mm: 5.5 cm3/ : 1.00 Dispersion 1000H.: (1.50) Testing: **KO4**

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop Speed 1/min : 315

Contr.-rod trav.mm: (12,6...14,0)

Del.quantity cm3/:1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop 1/min : 2950 Speed Contr.-rod trav.mm: 0.0...1.0

Electric current

short-duration A: 3.0

Starting test

Speed 1/min : 100 Del.quantity cm3/: 55.0 min. 1000H.: -

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.80). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.50, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)

K05

Control lever at full-load stop. With n=1000 1/min., I=2.5 A, control-rodtravel reduction = 2.25...2.55 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3.0 W11 : 07.11.86

Superceeded

Calibrating oil : ISO-4113

: 0 400 076 978 Combination no.

Injection pump

Pump designation EP type number : PES6M55C32ORS157-1

: 0 410 056 991

Governor

Governor design. Governer no. : RSF315/2300M65-12 : 0 420 021 088

Customer-spec. information Customer : DB

: 0M603A Engine

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values ____

START OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00 Cam sequence : 1-5-3-6-2-4

SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00) SD mark cyl. no. : 1 BASIC SETTING	Testing: Speed 1/min: 200 C-rod trav.mm min: 7.00 Speed 1/min: 290 C-rod trav.mm : 5.305.50 C-rod trav.mm : 2.50 Speed 1/min: 510610 Speed 1/min: 1000 C-rod trav.mm max: 1.80
1st speed 1/mi: 1000 ContrFod trav.mm: 13.9014.00	SET IDLE AUXILIARY SPRING Speed 1/min: 360 Contrrod trav.mm: 4,204,40 : (4,104,50)
Del.quantity cm3/: 5.15.2 100H.: (5.05.3) Dispersion cm3/: 0.2 100H.: (0.3)	TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min: 1000 C-rod trav.mm: 13.9014.00 2nd speed 1/min: 1600 C-rod trav.mm: 13.2013.40 3rd speed 1/min: 2200
2nd speed	C-rod trav.mm : 12.3012.50 compensator (LDA,ADA,ALDA) 1st version
FULL-LOAD DELIV. AT FULL-LOAD STOP 1st version Speed 1/min: 1000 Charge press. hPa: 1850 Del.quantity cm3/: 51.052.0 1000H.: (50.053.0) Dispersion cm3/: 2.50 1000H.: (3.00)	Setting Speed 1/min: 1000 Pressure hPa: 1600 Contrrod trav.mm: 0.500.90 Measurement Speed 1/min: 1000 1st pressure hPa: 1050 C-rod trav.mm: 3.904.10
HIGHEST RATED SPEED 1st version Control-lever position degrees: 500 3rd c-rod trav.mm: 8,108,50 Speed 1/min: 2500 4th speed 1/min: 2950 C-rod trav.mm: 0.001.00	2nd pressure hPa : 750 C-rod trav.mm : 5.806.20 FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 1850 Speed 1/min : 1600 Del.quantity cm3/ : 50.051.5 1000H.: (49.052.5)
SET IDLE CONTROL-LEVER POSITION Speed 1/min: 1000 Contrrod trav.mm: 1,71,8 LOWEST RATED SPEED I Control-lever position degrees: 812 Setting point w/out aux. spring Speed 1/min: 290 Contrrod trav.mm: 5.4	Dispersion cm3/: 2.50 1000H.: (3.00) Charge press. hPa: 1850 Speed 1/min: 2200 Del.quantity cm3/: 48.550.5 1000H.: (47.551.5) Dispersion cm3/: 2.50 1000H.: 3.00 Charge press. hPa: 1050 Speed 1/min: 1000 Del.quantity cm3/: 33.034.0 1000H.: (32.035.0)

Dispersion cm3/: 2.50

1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/: 52.0...0.0 1000H.: (52.0...0.0) Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

1st version

Charge press. hPa : 1850 1/min : 2500 Speed

Contr.-rod trav.mm: 8.10...8.50 Del.quantity cm3/: 29.0...33.0 1000H.: (28.0...34.0)

cm3/: 2.50Dispersion

1000H.: (3.00)

LOW IDLE

1/min : 290 Speed

Contr.-rod trav.mm: 5.30...5.50 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5)

cm3/: 1.00Dispersion

1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop Speed

1/min : 315

Contr.-rod trav.mm: (12,8...14,2)

Del.quantity cm3/: -1000H.: (42,0...49,0)

Electric current A: 1,8 Control lever at full-load stop

1/min : 2950 Speed

Contr.-rod trav.mm: (0,0...1,0)

Electric current

short-duration A: 3,0

Starting test

1/min : 100

Del.quantity cm3/: - min. 1000H.: 52,0

Remarks:

SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.70 (19.2...19.8°).

Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

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BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                    SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
                   : MB 3,0 W12
Test sheet
                   : 07.11.86
Edition
Superceeded
                                                    SD mark cyl. no. : 1
Calibrating oil
                   : ISO-4113
                                                    BASIC SETTING
Combination no.
                   : 0 400 076 979
                                                                   1/mi: 1000
                                                    1st speed
Injection pump
                                                    Contr.-rod trav.mm: 13.90...14.00
                   : PES6M55C32ORS157-1
Pump designation
EP type number
                   : 0 410 056 991
                                                    Del.quantity cm3/ : 5.1...5.2
Governor
Governor design. : RSF315/2300M65-10
                                                                  100H.: (5.0...5.3)
Governer no.
                   : 0 420 021 087
Customer-spec. information
                                                    Dispersion
                                                                  cm3/:0.2
Customer
                   : DB
                                                                  100H.: (0.3)
Engine
                   : OM603A Touring
                                                                  1/min: 290.0
                                                    2nd speed
1st version kW
                                                    Contr.-rod trav. m: 5.3...5.5
                   : 110.0
                                                    Del.quantity cm3/: 0.5...0.6
100H.: (0.5...0.9)
TEST BENCH REQUIREMENTS
                                                                  cm3/: 0.1
100H.: (0.1)
                                                    Dispersion
Calibrating-oil inlet temp. °C
                   : 38...42
                                                    FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                   : 1 469 990 351
                                                    1st version
                                                    Speed
                                                                  1/min: 1000
                                                    Charge press. hPa : 1850
Inlet press., bar : 1.00
                                                    Del.quantity cm3/: 51.0...52.0
1000H.: (50.0...53.0)
Calibrating nozzle-holder
                : 0 681 343 009
                                                                 cm3/ : 2.50
 assembly
                                                    Dispersion
                                                                 1000H.: (3.00)
Opening
 pressure, bar : 172...175
                                                    HIGHEST RATED SPEED
                                                    1st version
                                                    Control-lever
Test inj. tubing : 1 680 750 014
                                                     position degrees: 50...0
                                                    3rd c-rod trav.mm: 8,10...8,50
Speed 1/min: 2500
Outside diameter
x Wall thickness
                                                                 1/min: 2950
                                                    4th speed
                   : 6.00X2.00X600
                                                      C-rod trav.mm : 0.00...1.00
x Length mm
(A) Injection pump setting values
                                                    SET IDLE CONTROL-LEVER
    Insp. values in parentheses
Set constant delivery quant.
                                                    POSITION
                                                                 1/min : 1000
                                                    Speed
    per values ____
                                                    Contr.-rod trav.mm: 1,7...1,8
                                                    LOWEST RATED SPEED I
START OF DELIVERY
Test pressure, bar: 30...32
                                                    Control-lever
                                                     position degrees: 8...12
                   : 2.20...2.30
                                                    Setting point w/out aux. spring
Prestroke mm
                   : (2.15...2.35)
                                                                1/min : 290
                                                    Speed
Contr.-rod trav.mm: 20.00...22.00
                                                    Contra-rod tray.mm: 5.4
Cam sequence : 1- 5- 3- 6-
                                    2-
K09
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cm3/: 2.50Testing: Dispersion 1/min : 200 1000H.: 3.00 Speed C-rod trav.mm min : 7.00 1/min : 290 Speed C-rod trav.mm : 5.30...5.50 STARTING FUEL DELIVERY C-rod trav.mm : 2.50 1/min: 510...610 Speed 1/min : 1000 Speed Speed 1/min : 100 Del.quantity cm3/: 52.0...0.0 1000H.: (52.0...0.0) Contr.-rod trav.mm: 20.10...0.00 C-rod trav.mm max: 1.80 SET IDLE AUXILIARY SPRING Speed 1/min : 360 Contr.-rod trav.mm: 4,20...4,40 HIGH IDLE : (4,10...4,50) 1st version TORQUE CONTROL Charge press. hPa: 1850 Torque-control curve - 1st version 1/min : 2500 Speed Contr.-rod trav.mm: 8.10...8.50
Del.quantity cm3/: 29.0...33.0
1000H.: (28.0...34.0)
Dispersion cm3/: 2.50 1st speed 1/min : 1000 : 13.90...14.00 C-rod trav.mm 1/min : 1600 2nd speed C-rod trav.mm : 13.20...13.40 1/min : 2200 1000Ha: (3.00) 3rd speed C-rod trav.mm : 12.30...12.50 LOW IDLE compensator (LDA,ADA,ALDA) Speed 1/min : 290 Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/: 5.5...6.5
1000H.: (5.0...9.5)
Dispersion cm3/: 1.00 1st version Setting 1/min : 1000 Speed 1000H.: (1.50) hPa : 1600 Pressure Contr.-rod trav.mm: 0.50...0.90 SETTING/TESTING ELECTRONIC IDLE Measurement REGULATION (ELR) 1/min: 1000 Speed Control lever at idle stop 1/min: 315 1st pressure hPa : 1050 Speed 2nd pressure hPa : 750 C-rod tray Contr.-rod trav.mm: (12,8...14,2) Del.quantity cm3/: -1000H.: (42,0...49,0) Electric current A: 1,8 Control lever at full-load stop FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 2950 1st version Contr.-rod trav.mm: (0,0...1,0) Electric current Charge press. hPa : 1850 Speed 1/min: 1600 Del.quantity cm3/: 50.0...51.5 1000H.: (49.0...52.5) short-duration A: 3,0 Starting test 1/min : 100 Del.quantity cm3/: -min. 1000H.: 52,0 cm3/: 2.50Dispersion 1000H.: (3.00) Charge press. hPa : 1850 1/min : 2200 Remarks: Speed Del.quantity cm3/: 48.5...50.5 1000H.: (47.5...51.5) Dispersion cm3/: 2.50 SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). 1000H.: 3.00 Charge press. hPa: 1050 Cam angle according to cyl. 1. Speed 1/min : 1000 Del.quantity cm3/ : 33.0...34.0 1000H.: (32.0...35.0)

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                         SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
Test sheet
                     : MB 3.0 W14
: 07.11.86
Edition
Superceeded
                                                         SD mark cyl. no. : 1
Calibrating oil : ISO-4113
                                                         BASIC SETTING
                     : 0 400 076 982
Combination no.
                                                                         1/mi: 1000
                                                         1st speed
Injection pump
Pump designation : PES6M55C32ORS156
                                                         Contr.-rod trav.mm: 11.30...11.40
EP type number
                    : 0 410 056 995
                                                         Del.quantity cm3/: 3.1...3.2
Governor
Governor design. : RSF315/2300M60-14
Governer no.
                     : 0 420 021 080
                                                                        100H.: (3.0...3.3)
Customer-spec. information
                                                         Dispersion
                                                                        cm3/:0.2
Customer
                    : DB
                                                                        100H.: (0.3)
                     : 0M603-3.0
Engine
                                                         2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/: 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/: 0.1

100H.: (0.1)
1st version kW
                     : 80.0
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                     : 38...42
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                     : 1 469 990 351
                                                         1st version
                                                                        1/min: 1000
                                                         Speed
                                                         Del.quantity cm3/: 31.5...32.5
Inlet press., bar : 1.00
                                                                       1000H.: (30.5...33.5)
cm3/ : 2.50
1000H.: (3.00)
Calibrating nozzle-holder
                                                         Dispersion
               : 0 681 343 009
 assembly
                                                         HIGHEST RATED SPEED
Opening
 pressure, bar : 172...175
                                                         1st version
                                                         Control-lever
                                                         position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20
Test inj. tubing
                    : 1 680 750 014
                                                           Speed 1/min: 2500
th speed 1/min: 2950
C-rod trav.mm: 0.00...1.00
Outside diameter x Wall thickness
                                                         4th speed
                     : 6.00x2.00x600
x Length mm
                                                         SET IDLE CONTROL-LEVER
(A) Injection pump setting values
                                                         POSITION
    Insp. values in parentheses
Set constant delivery quant.
                                                                       1/min : 1000
                                                         Speed
                                                         Contr.-rod trav.mm: 0,9...1,0
    per values
                                                         LOWEST RATED SPEED I
START OF DELIVERY
                                                         Control-lever
Test pressure, bar: 30...32
                                                          position degrees: 13...17
                                                         Setting point w/out aux. spring
                                                                       1/min : 290
Prestroke mm
                     : 2.00...2.10
                                                         Contr.-rod trav.mm: 5.5
                     : (1.95...2.15)
Contr.-rod trav.mm: 20.00...22.00
Cam sequence : 1-5-3-6-2-4
                                                         Testing:
```

1/min : 220 Speed C-rod trav.mm min: 7.00 Speed 1/min: 290 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 : 5.40...5.60 C-rod trav.mm Del.quantity cm3/: 22.0...26.0 1000H: (21.0...27.0) Dispersion cm3/: 2.50 C-rod trav.mm : 1.50 1/min: 620...720 Speed 1/min : 1000 Speed 1000H.: (3.00) C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING LOW IDLE Speed 1/min : 360 Contr.-rod trav.mm: 4,20...4,40 Speed 1/min: 290 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) : (4,10...4,50) TORQUE CONTROL cm3/:1.00Torque-control curve - 1st version Dispersion 1000H.: (1.50) 1st speed 1/min : 1000 C-rod trav.mm : 11.30...11.40 2nd speed 1/min : 1800 SETTING/TESTING ELECTRONIC IDLE C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 REGULATION (ELR) C-rod trav.mm : 10.60...10.80 Control lever at idle stop 1/min : 315 Speed Contr.-rod trav.mm: (12,6...14,0) compensator (LDA,ADA,ALDA) Del.quantity cm3/:-1000H.: (32,0...40,0) Electric current A: 1,8 1st version Control lever at full-load stop Setting 1/min : 2950 Speed 1/min : 1000 Speed hPa : 930 Contr.-rod trav.mm: (0,0...1.0) Pressure Contr.-rod trav.mm: 0.10...0.50 Electric current short-duration A: 3,0 Measurement Starting test 1/min : 1000 1/min : 100 Speed Speed Del.quantity cm3/: - min. 1000H.: 55,0 1st pressure hPa : 840 2nd pressure hPa : 700 Remarks: C-rod trav.mm : 2.30...2.70 SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 Cam angle according to cyl. 1. 1000H.: (32.5...36.5) cm3/: 2.50 Start-of-delivery spacing (difference) between max/min value 10 cam angle Dispersion 1000H.: 3.00 maximum. STARTING FUEL DELIVERY CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. 1/min : 100 Speed At n = 290 1/min and pu = 450 mbar Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) control rod must move briskly to Contr.-rod trav.mm: 20.10...0.00 control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                         SD ang. spacing ^{0} CS: 0-60-120-180-240-300 Tolerance + - ^{0} : 0.00 (1.00)
Test sheet
Edition
Superceeded
                     : MB 3.0 W15 : 14.11.86
                                                         SD mark cyl. no. : 1
Calibrating oil : ISO-4113
                                                         BASIC SETTING
Combination no.
                    : 0 400 076 983
                                                                         1/mi: 1000
                                                         1st speed
Injection pump
Pump designation : PES6M55C32ORS150
                                                         Contr.-rod trav.mm: 11.30...11.40
EP type number : 0 410 056 995
                                                         Del.quantity cm3/: 3.1...3.2
Governor
Governor design.
                     : RSF315/2300M59-15
Governer no.
                     : 0 420 021 075
                                                                        100H.: (3.0...3.3)
                                                                        cm3/ : 5.2
Customer-spec. information
                                                         Dispersion
Customer
                    : DB
                                                                        100H.: (0.3)
Engine
                     : DM603-3.0
                                                         2nd speed 1/min: 290.0
Contr.-rod trav. m: 5.4...5.6
Del.quantity cm3/: 0.5...0.6
100H.: (0.5...0.9)
1st version kW
                     : 80.0
TEST BENCH REQUIREMENTS
                                                                        cm3/:0.1
                                                         Dispersion
Calibrating-oil inlet temp. °C
                                                                        100H.: (0.1)
                     : 38...42
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                     : 1 469 990 351
                                                         1st version
                                                         Speed 1/min: 1000
Del.quantity cm3/: 31.5...32.5
1000H: (30.5...33.5)
Dispersion cm3/: 2.50
Inlet press., bar : 1.00
Calibrating nozzle-holder
                                                                       1000H.: (3.00)
 assembly
               : 0 681 343 009
Opening
                                                         HIGHEST RATED SPEED
 pressure, bar : 172...175
                                                         1st version
                                                         Control-lever
                                                          position degrees: 0...50
                                                         3rd c-rod trav.mm: 7,80...8,20
Speed 1/min: 2500
4th speed 1/min: 2950
Test inj. tubing : 1 680 750 014
Outside diameter
x Wall thickness
                                                           C-rod trav.mm : 0.00...1.00
              : 6.00x2.00x600
x Length mm
                                                         SET IDLE CONTROL-LEVER
                                                         POSITION
(A) Injection pump setting values
    Insp. values in parentheses
                                                                       1/min : 1000
    Set constant delivery quant.
                                                         Contr.-rod trav.mm: 0,9...1,0
    per values
                                                         LOWEST RATED SPEED I
START OF DELIVERY
                                                         Control-lever
Test pressure, bar: 30...32
                                                          position degrees: 13...17
                                                         Setting point w/out aux. spring
                     : 2.00...2.10
: (1.95...2.15)
                                                                  1/min : 290
Prestroke mm
                                                         Contra-rod trav.mm: 5.5
Contr.-rod trav.mm: 20.00...22.00
Cam sequence : 1-5- 3- 6- 2- 4
                                                         Testing:
```

Speed 1/min : 220 C-rod trav.mm min: 7.00 1/min : 290 Speed : 5.40...5.60 : 1.50 C-rod trav.mm C-rod trav.mm 1/min : 620...720 Speed 1/min: 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING Speed 1/min : 360 Contr.-rod trav.mm: 4,20...4,40 (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed : 11.30...11.40 C-rod trav.mm 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 1800 Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H:: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H:: (32.5...36.5) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 55.0...0.0 1000H.: (55.0...0.0) Contra-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min : 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50Dispersion 1000H.: (3.00) LOW IDLE Speed 1/min: 290 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) cm3/:1.00Dispersion 1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed 1/min: 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/:1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min: 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-direction A: 3.0

short-duration A: 3,0 Starting test Speed 1/min: 100 Del.quantity cm3/: min. 1000H.: 55,0

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                     SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
Test sheet
                   : MB 3.0 W16
: 07.11.86
Edition
Superceeded
                                                     SD mark cyl. no. : 1
Calibrating oil : ISO-4113
                                                     BASIC SETTING
Combination no.
                   : 0 400 076 984
                                                     1st speed
                                                                    1/mi: 1000
Injection pump
Pump designation : PES6M55C32ORS156
                                                     Contr.-rod trav.mm: 11.30...11.40
EP type number
                   : 0 410 056 995
                                                     Del.quantity cm3/ : 3.1...3.2
Governor
Governor design.
                   : RSF315/2300M59-13
                   : 0 420 021 073
                                                                   100H.: (3.0...3.3)
Governer no.
Customer-spec. information
                                                     Dispersion
                                                                   cm3/:0.2
Customer
                   : DB
                                                                   100H.: (0.3)
Engine
                    : 0M603-3.0
                                                     2nd speed 1/min: 290.0
Contr.-rod trav. m: 5.4...5.6
Del.quantity cm3/: 0.5...0.6
                   : 80.0
1st version kW
                                                                   100H.: (0.5...0.9)
TEST BENCH REQUIREMENTS
                                                                   cm3/: 0.1
100H.: (0.1)
                                                     Dispersion
Calibrating-oil inlet temp. °C
                    : 38...42
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                    : 1 469 990 351
                                                     1st version
                                                                   1/min: 1000
                                                     Speed
                                                     Del.quantity cm3/: 31.5...32.5
Inlet press., bar: 1.00
                                                                  1000H.: (30.5...33.5)
cm3/ : 2.50
1000H.: (3.00)
Calibrating nozzle-holder
                                                     Dispersion
 assembly
              : 0 681 343 009
                                                     HIGHEST RATED SPEED
Opening
 pressure, bar : 172...175
                                                     1st version
                                                     Control-lever
                                                     position degrees: 50...0

3rd c-rod trav.mm: 7,80...8,20
Test inj. tubing : 1 680 750 014
                                                                  1/min : 2500
                                                       Speed
Outside diameter
                                                                  1/min : 2950
                                                     4th speed
x Wall thickness
                                                       C-rod trav.mm : 0.00...1.00
x Length mm
                   : 6.00x2.00x600
                                                     SET IDLE CONTROL-LEVER
(A) Injection pump setting values
                                                     POSITION
    Insp. values in parentheses
                                                                  1/min : 1000
                                                     Speed
    Set constant delivery quant.
                                                     Contr.-rod trav.mm: 0,9...1,0
    per values
                                                     LOWEST RATED SPEED I
START OF DELIVERY
                                                     Control-lever
Test pressure, bar: 30...32
                                                      position degrees: 13...17
                                                     Setting point w/out aux. spring
                   : 2.00...2.10
                                                                 1/min : 290
Prestroke mm
                   : (1.95...2.15)
                                                     Contr.-rod trav.mm: 5.5
Contr.-rod trav.mm: 20.00...22.00
                   : 1-5-3-6-2-4
Cam sequence
                                                     Testing:
K17
```

1/min : 220 Speed C-rod trav.mm min: 7.00 1/min : 290 Speed C-rod trav.mm : 5.40...5.60 C-rod trav.mm : 1.50 Speed 1/min : 620...720 1/min: 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING Speed 1/min : 360 Contr.-rod trav.mm: 4,20...4,40 (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1/min : 1000 1st speed C-rod trav.mm : 11.30...11.40 2nd speed 1/min: 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 1800
Del.quantity cm3/: 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/: 2.50
1000H.: (3.00)
Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) Dispersion cm3/: 2.50 1000H.: 3.00 STARTING FUEL DELIVERY HIGH IDLE 1/min : 2500 Speed Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) Dispersion cm3/: 2.50 1000H.: (3.00) LOW IDLE 1/min : 290 Speed Contr.-rod trav.mm: 5.40...5.60
Del.quantity cm3/: 5.5...6.5
1000H: (5.0...9.5)
Dispersion cm3/: 1.00 1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE
REGULATION (ELR)

Control lever at idle stop
Speed 1/min: 315
Control trav.mm: (12,6...14,0)
Del.quantity cm3/:1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min: 2950
Control rav.mm: (0,0...1,0)
Electric current
Short-duration A: 3,0

short-duration A: 3,0 Starting test Speed 1/min: 100 Del.quantity cm3/: min. 1000H.: 55,0

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.00 (1.00) : MB 3,0 W17 Test sheet : 12.09.86 Edition Superceeded SD mark cyl. no. : 1 : ISO-4113 Calibrating oil BASIC SETTING Combination no. : 0 400 076 985 1st speed 1/mi: 1000 Injection pump Pump designation : PES6M55C32ORS157-1 Contr.-rod trav.mm: 13.90...14.00 EP type number : 0 410 056 991 Del.quantity cm3/ : 5.1...5.2 Governor Governor design. : RSF315/2300M65-2 Governer no. : 0 420 021 062 100H.: (5.0...5.3) Customer-spec. information Dispersion cm3/:0.2Customer : DB 100H.: (0.3) Engine : 0M603A 2nd speed 1/min: 290.0 Contr.-rod trav. m: 5.3...5.5 Del.quantity cm3/: 0.5...0.6 100H.: (0.5...0.9) 1st version kW : 110.0 TEST BENCH REQUIREMENTS cm3/:0.1Dispersion Calibrating-oil inlet temp. OC 100H.: (0.1) : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Overflow valve : 1 469 990 351 1st version Speed 1/min: 1000 Charge press. hPa : 1850 Inlet press., bar : 1.00 Del.quantity cm3/: 51.0...52.0 1000H.: (50.0...53.0) Dispersion cm3/: 2.50 1000H.: (3.00) Calibrating nozzle-holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 HIGHEST RATED SPEED 1st version Control-lever Test inj. tubing : 1 680 750 014 position degrees: 50...0 3rd c-rod trav.mm: 8,10...8,50 Speed 1/min: 2500 4th speed 1/min: 2950 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm C-rod trav.mm : 0.00...1.00 (A) Injection pump setting values SET IDLE CONTROL-LEVER Insp. values in parentheses Set constant delivery quant. POSITION Speed 1/min : 1000 per values ____ Contr.-rod trav.mm: 1,7...1,8 LOWEST RATED SPEED I START OF DELIVERY Test pressure, bar: 30...32 Control-lever position degrees: 8...12 Setting point w/out aux. spring : 2.20...2.30 Prestroke mm : (2.15...2.35) 1/min : 290 Contr.-rod trav.mm: 20.00...22.00 Contr.-rod trav.mm: 5.4 Cam sequence : 1-5-3-6-

Testing: cm3/: 2.50 1000H.: 3.00 Dispersion 1/min : 200 Speed C-rod trav.mm min: 7.00 Speed 1/min : 360 : 4.20...4.40 C-rod trav.mm STARTING FUEL DELIVERY : 2.50 C-rod trav.mm 1/min: 510...610 Speed 1/min: 1000 1/min : 100 Speed Speed Contr.-rod trav.mm: 20.10...0.00 C-rod trav.mm max: 1.80 SET IDLE AUXILIARY SPRING HIGH IDLE 1/min : 360 Contr.-rod trav.mm: 4,20...4,40 1st version : (4,10...4,50) Charge press. hPa: 1850 Speed 1/min: 2500 TORQUE CONTROL Contr.-rod trav.mm: 8.10...8.50 Del.quantity cm3/: 29.0...33.0 1000H.: (28.0...34.0) Dispersion cm3/: 2.50 1000H.: (3.00) Torque-control curve - 1st version 1/min : 1000 1st speed : 13.90...14.00 C-rod trav.mm 1/min : 1600 2nd speed : 13.20...13.40 C-rod trav.mm LOW IDLE 1/min : 2200 3rd speed : 12.30...12.50 C-rod trav.mm Speed 1/min : 290 Contr.-rod trav.mm: 5.30...5.50 compensator (LDA, ADA, ALDA) Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) Dispersion cm3/: 1.00 1st version Setting 1000H.: (1.50) 1/min : 1000 Speed hPa : 1600 SETTING/TESTING ELECTRONIC IDLE Pressure Contr.-rod trav.mm: 0.50...0.90 REGULATION (ELR) Control lever at idle stop Measurement 1/min : 315 Speed 1/min : 1000 Speed Contr.-rod trav.mm: (12,8...14,2) 1st pressure hPa : 1050 Del.quantity cm3/:-1000H.: (42,0...49,0) Electric current A: 1,8 : 3.90...4.10 C-rod trav.mm 2nd pressure hPa : 750 : 5.80...6.20 Control lever at full-load stop C-rod trav.mm 1/min : 2950 Speed Contr.-rod trav.mm: (0,0...1,0) FUEL-DELIVERY CHARACTERISTICS Electric current short-duration A: 3,0 1st version Charge press. hPa: 1850 Starting test 1/min: 1600 1/min : 100 Speed Del.quantity cm3/: 50.0...51.5 Delaquantity cm3/: -1000H.: 52,0 1000H.: (49.0...52.5) min. cm3/ : 2.50 Dispersion 1000H.: (3.00) Remarks: Charge press. hPa: 1850 SETTING OF FBG 1/min : 2200 -Setting and locking of FBG according Speed to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Del.quantity cm3/: 48.5...50.5 1000H.: (47.5...51.5) cm3/: 2.50 1000H.: 3.00 Cam angle according to cyl. 1. Dispersion Charge press. hPa : 1050 Speed 1/min : 1000 Del.quantity cm3/: 33.0...34.0 1000H.: (32.0...35.0)

Start-of-delivery spacing (difference) between max/min value 10 cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                        SD ang. spacing CS: 0-60-120-180-240-300 Tolerance 4 - 5 0.00 (1.00)
                    : MB 3.0 W5 : 12.09.86
Test sheet
Edition
                    : 04.86
Superceeded
                                                        SD mark cyl. no. : 1
                    : ISO-4113
Calibrating oil
                                                        BASIC SETTING
                     : 0 400 076 988
Combination no.
                                                        1st speed
                                                                        1/mi: 1000
Injection pump
Pump designation : PES6M55C32ORS156
                                                        Contr.-rod trav.mm: 11.30...11.40
EP type number
                     : 0 410 056 995
                                                        Del.quantity cm3/: 3.1...3.2
Governor
                     : RSF315/2300M60-4
Governor design.
Governer no.
                                                                       100H.: (3.0...3.3)
                     : D 420 021 057
                                                                       cm3/: 0.2
Customer-spec. information
                                                        Dispersion
Customer
                    : DB
                                                                       100H.: (0.3)
                     : DM603-3.0
Engine
                                                        2nd speed 1/min: 290.0
Contr.-rod trav. m: 5.4...5.6
Del.quantity cm3/: 0.5...0.6
100H.: (0.5...0.9)
1st version kW
                     : 80.0
TEST BENCH REQUIREMENTS
                                                                       cm3/:0.1
                                                        Dispersion
Calibrating-oil inlet temp. °C
                                                                       100H .: (0,1)
                     : 38...42
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                     : 1 469 990 351
                                                        1st version
                                                        Speed 1/min: 1000
Del.quantity cm3/: 31.5...32.5
1000H.: (30.5...33.5)
Dispersion cm3/: 2.50
Inlet press., bar : 1.00
Calibrating nozzle-holder
              : 0 681 343 009
                                                                      1000H.: (3.00)
 assembly
                                                        HIGHEST RATED SPEED
Opening
 pressure, bar : 172...175
                                                        1st version
                                                        Control-lever
                                                        position degrees: 50...0
3rd c-rod trav.mm: 7,80...8,20
                    : 1 680 750 014
Test inj. tubing
                                                                     1/min : 2500
                                                          Speed
                                                        4th speed 1/min : 2950
Outside diameter
x Wall thickness
                                                          C-rod trav.mm : 0.00...1,00
                    : 6.00X2.00X600
x Length mm
                                                        SET IDLE CONTROL-LEVER
(A) Injection pump setting values
                                                        POSITION
    Insp. values in parentheses
Set constant delivery quant.
                                                                      1/min : 1000
                                                        Speed
                                                        Contr.-rod trav.mm: 0,9...1,0
    per values ____
                                                        LOWEST RATED SPEED I
                                                        Control-lever
START OF DELIVERY
Test pressure, bar: 30...32
                                                         position degrees: 13...17
                                                        Setting point w/out aux. spring Speed 1/min: 290
                     : 2.00...2.10
Prestroke mm
                     : (1.95...2.15)
                                                        Contra-rod trav.mm: 5.5
Contr.-rod trav.mm: 20.00...22.00
                    : 1-5- 3- 6- 2-
                                                        Testing:
Cam sequence
```

Speed 1/min : 220 1/min : 2500 Contr.-rod trav.mm: 7.80...8.20 C-rod trav.mm min : 7.00 1/min : 360 Del.quantity cm3/: 22.0...26.0 Speed 1000H.: (21.0...27.0) cm3/: 2.50 1000H.: (3.00) C-rod trav.mm : 4.20...4.40 : 1.50 C-rod tray.mm Dispersion 1/min : 620...720 1/min : 1000 Speed Speed C-rod trav.mm max: 1.00 LOW IDLE SET IDLE AUXILIARY SPRING 1/min: 290 Speed Contr.-rod trav.mm: 5.40...5.60 Speed 1/min: 360 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) cm3/: 1.00 1000H.: (1.50) Dispersion TORQUE CONTROL Torque-control curve - 1st version 1st speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 Control lever at idle stop 3rd speed 1/min : 2200 Speed 1/min : 315 C-rod trav.mm : 10.60...10.80 Contr.-rod trav.mm: (12,6...14,0) Del.quantity cm3/: -1000H:: (32,0...40,0) compensator (LDA,ADA,ALDA) Electric current A: 1,8 Control lever at full-load stop Speed 1/min: 2950 1st version Contr.-rod trav.mm: (0,0...1,0) Setting 1/min : 1000 Electric current Speed hPa : 930 Pressure short-duration A: 3,0 Contr.-rod trav.mm: 0.10...0.50 Starting test 1/min : 100 Speed Del.quantity cm3/: -min. 1000H.: 55,0 Measurement Speed 1/min: 1000 1st pressure hPa : 840 Remarks: C-rod trav.mm : 1.10...1.30 Pin projection = 16.60...16.70 mm 2nd pressure hPa : 700 : 2.30...2.70 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS SETTING OF FBG Speed 1/min : 1800 Del.quantity cm3/: 34.0...35.5 1000H.: (33.0...36.5) Dispersion cm3/: 2.50 1000H.: (3.00) Speed 1/min: 2200 -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1. Del.quantity cm3/: 33.5...35.5 1000H:: (32.5...36.5) cm3/: 2.50 1000H.: 3.00 Dispersion Start-of-delivery spacing (difference) between max/min value 10 cam angle STARTING FUEL DELIVERY maximum. Speed 1/min : 100 Contr.-rod trav.mm: 20.10...0.00 CHECKING THE PNEUMATIC SHUTOFF BOX HIGH IDLE -Control lever up against idle stop. **K23**

At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                         SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
Test sheet
                    : MB 3.0 W1
: 09.03.87
Edition
Superceeded
                    : 11.85
                                                         SD mark cyl. no. : 1
Calibrating oil : ISO-4113
                                                         BASIC SETTING
                    : 0 400 076 990
Combination no.
                                                         1st speed
                                                                       1/mi: 1000
Injection pump
Pump designation : PES6M55C320RS156
                                                         Contr.-rod trav.mm: 11.30...11.40
EP type number : 0 410 056 995
                                                         Del.quantity cm3/: 3.1...3.2
Governor
Governor design. : RSF315/2300M59-5
Governer no. : 0 420 021 045
                                                                        100%; (3.0...3.3)
Customer-spec. information
                                                         Dispersion
                                                                        cm3/:0.2
Customer
                    : DB
                                                                        100H.: (0.3)
Engine
                     : 0M603-3.0
                                                                        1/min: 290
                                                         2nd speed
                                                         Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/: 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/: 0.1

100H.: (0.1)
1st version kW
                     : 80.0
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. <sup>D</sup>C
                     : 38...42
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                     : 1 469 990 351
                                                         1st version
                                                         Speed 1/min: 1000
Del.quantity cm3/: 31.5...32.5
1000H: (30.5...33.5)
Dispersion cm3/: 2.50
Inlet press., bar : 1.00
Calibrating nozzle-holder
                    : 0 68i 343 009
                                                                       1000H.: (3.00)
 assembly
                                                         HIGHEST RATED SPEED
Opening
pressure, bar : 172...175
                                                         1st version
                                                         Control-lever
                                                         position degrees: 0...50
                                                         3rd c-rod trav.mm: 7,80...8,20
Speed 1/min: 2500
4th speed 1/min: 2950
Test inj. tubing : 1 680 750 014
Outside diameter
                                                           C-rod trav.mm : 0.00...1.00
x Wall thickness
                    : 6.00x2.00x600
x Length mm
                                                         SET IDLE CONTROL-LEVER
                                                         POSITION
(A) Injection pump setting values
    Insp. values in parentheses
                                                                       1/min : 1000
                                                         Speed
                                                         Contr.-rod trav.mm: 0,9...1,0
    Set constant delivery quant.
    per values ____
                                                         LOWEST RATED SPEED I
                                                         Control-lever
START OF DELIVERY
                                                         position degrees: 13...17
Setting point w/out aux. spring
Test pressure, bar: 30...32
                                                                      1/min : 290
                     : 2.00...2.10
Prestroke mm
                     : (1.95...2.15)
                                                         Contr.-rod trav.mm: 5.5
Contr.-rod trav.mm: 20.00...22.00
Cam sequence : 1-5-3-6-2-4
                                                         Testing:
```

C-rod trav.mm min: 7.00 1/min : 290 Speed C-rod trav.mm : 5.40...5.60 : 1.50 C-rod trav.mm 1/min: 620...720 Speed 1/min : 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING 1/min : 360 Speed Contr.-rod trav.mm: 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 C-rod trav.mm : 11.30...11.40 2nd speed 1/min: 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS 1/min : 1800 Speed Speed 1/min: 1000
Del.quantity cm3/: 34.0...35.5
1000H.: (33.0...36.5)
Dispersion cm3/: 2.50
1000H.: (3.00)
Speed 1/min: 2200
Del.quantity cm3/: 33.5...35.5
1000H.: (32.5...36.5) cm3/: 2.50 1000H.: 3.00 Dispersion STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 55.0...0.0 1000H:: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50 1000H.: (3.00) Dispersion LOW IDLE 1/min : 290 Speed K26

1/min : 220

Speed

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min: 315
Contr.-rod trav.mm: (12,6...14,0)
Del.quantity cm3/:1000H.: (32,0...40,0)
Electric current A: 1,8
Control lever at full-load stop
Speed 1/min: 2950
Contr.-rod trav.mm: (0,0...1,0)
Electric current
short-duration A: 3,0
Starting test
Speed 1/min: 100
Del.quantity cm3/:min. 1000H.: 55,0

Remarks: SETTING OF FBG -Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°). Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                     SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.00 (1.00)
Test sheet
                    : MB 3.0 W
: 09.03.87
Edition
Superceeded
                                                     SD mark cyl. no. : 1
                   : 11.85
Calibrating oil
                   : ISO-4113
                                                     BASIC SETTING
                    : 0 400 076 994
Combination no.
                                                     1st speed
                                                                    1/mi: 1000
Injection pump
Pump designation
                   : PES6M55C32ORS156
                                                     Contr.-rod trav.mm: 11.30...11.40
EP type number
                   : 0 410 056 995
                                                     Del.quantity cm3/ : 3.1...3.2
Governor
Governor design. : RSF315/2300M59-3
                                                                    100H.: (3.0...3.3)
Governer no.
                    : 0 420 021 040
                                                                   cm3/:0.2
Customer-spec. information
                                                     Dispersion
Customer
                   : DB
                                                                   100H.: (0.3)
Engine
                    : 0M603-3.0
                                                     2nd speed
                                                                   1/min: 290
                                                     Contr.-rod trav. m: 5.4...5.6
1st version kW
                    : 80.0
                                                     Del.quantity cm3/: 0.5...0.6
100H.: (0.5...0.9)
TEST BENCH REQUIREMENTS
                                                                   cm3/: 0.1
100H.: (0.1)
                                                     Dispersion
Calibrating-oil inlet temp. °C
                    : 38...42
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Overflow valve
                    : 1 469 990 351
                                                     1st version
                                                     Speed
                                                                   1/min: 1000
                                                     Del.quantity cm3/: 31.5...32.5
Inlet press., bar : 1.00
                                                                  1000H.: (30.5...33.5)
cm3/ : 2.50
1000H.: (3.00)
Calibrating nozzle-holder
                                                     Dispersion
                : 0 681 343 009
 assembly
                                                     HIGHEST RATED SPEED
Opening
 pressure, bar
                   : 172...175
                                                     1st version
                                                     Control-lever
                                                      position degrees: 50...0
                                                     3rd c-rod trav.mm : 7,80...8,20
Test inj. tubing : 1 680 750 014
                                                                  1/min : 2500
                                                       Speed
                                                     4th speed 1/min: 2950
Outside diameter
                                                       C-rod trav.mm : 0.00...1.00
x Wall thickness
x Length mm
                   : 6.00X2.00X600
                                                     SET IDLE CONTROL-LEVER
                                                     POSITION
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                  1/min: 1000
                                                     Contr.-rod trav.mm: 0.9...1.0
    per values
                                                     LOWEST RATED SPEED I
                                                     Control-lever
START OF DELIVERY
Test pressure, bar: 30...32
                                                      position degrees: 13...17
                                                     Setting point w/out aux. spring
                   : 2.00...2.10
                                                                 1/min : 290
Prestroke mm
                                                     Contr.-rod trav.mm: 5.5
                    : (1.95...2.15)
Contr.-rod trav.mm: 20.00...22.00
Cam sequence : 1-5- 3- 6- 2- 4
                                                     Testing:
K27
```

Speed 1/min: 220 C-rod trav.mm min: 7.00 Speed 1/min: 290 : 5.40...5.60 C-rod trav.mm : 1.50 C-rod trav.mm 1/min : 620...720 Speed 1/min : 1000 Speed C-rod trav.mm max: 1.00 SET IDLE AUXILIARY SPRING Speed 1/min: 360 Contr.-rod trav.mm: 4,20...4,40 : (4.10...4.50) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1000 C-rod trav.mm : 11.30...11.40 2nd speed 1/min : 1800 C-rod trav.mm : 10.90...11.10 3rd speed 1/min : 2200 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS 1/min: 1800 Speed Del.quantity cm3/: 34.0...35.5 1000H:: (33.0...36.5) Dispersion cm3/: 2.50 1000H:: (3.00) Speed 1/min: 2200 Del.quantity cm3/: 33.5...35.5 1000H.: (32.5...36.5) cm3/: 2.50 Dispersion 1000H .: 3.00 STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/ : 55.0...0.0 1000H.: (55.0...0.0) Contr.-rod trav.mm: 20.10...0.00 HIGH IDLE Speed 1/min: 2500 Contr.-rod trav.mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000H.: (21.0...27.0) cm3/: 2.50 1000H.: (3.00) Dispersion LOW IDLE Speed 1/min: 290 Contr.-rod trav.mm: 5.40...5.60 Del.quantity cm3/: 5.5...6.5 1000H.: (5.0...9.5) cm3/: 1.00 1000H.: (1.50) Dispersion

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop Speed 1/min: 315 Contr.-rod trav.mm: (12,6...14,0) Del.quantity cm3/:-1000H.: (32,0...40,0) Electric current A: 1,8 Control lever at full-load stop

Speed 1/min: 2950 Contr.-rod trav.mm: (0,0...1,0) Electric current

short-duration A: 3,0 Starting test Speed 1/min: 100

Del.quantity cm3/: min. 1000H.: 55,0

Remarks:
SETTING OF FBG
-Setting and locking of FBG according
to start-of-delivery average of all
cylinders 19.3...19.7° (19.2...19.8°).
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS : 1- 6- 5- 4- 3- 2 Cam sequence Note inst. in remarks column SD ang. spacing CS: 0-75-120-195-240-315 Tolerance + - : 0.50 (0.75) : KHD 9.6 N 1 : 12.09.86 Test sheet Edition Superceeded Superceeded : 10.85 Calibrating oil : ISO-4113 SD mark cyl. no. : 1 Combination no. : 0 400 646 266 BASIC SETTING Injection pump 1/mi: 1150 1st speed Pump designation : PE6A95D410LS2587 EP type number : 0 410 696 983 Contr.-rod trav.mm: 8.30...8.40 Governor Governor design. : RQV300...1150AB1088L Del.quantity cm3/ : 7.2...7.4 : 0 420 212 115 Governer no. 100H.: (7.0...7.6) Customer-spec. information Customer : KHD Dispersion cm3/:0.3Engine : F6L413 100H.: (0.6) 2nd speed 1/min: 300.0 Contr.-rod trav. m: 5.9...6.1 Del.quantity cm3/: 0.9...1.5 100H.: (0.6...1.7) 1st version kW : 115.0 1/min: 2300 Speed TEST BENCH REQUIREMENTS cm3/ : 0.3Dispersion 100H.: (0.5) Calibrating-oil inlet temp. °C : 38...42 (B) Setting of injection pump with Overflow valve externally-mounted governor : 1 417 413 000 SLEEVE TRAVELS 1st speed 1/min: 300 Sleeve travel mm: 1.20...1.30 Inlet press., bar: 1.00 1/min: 400 Calibrating nozzle-holder 2nd speed Sleeve travel mm: 2,30...2.70 : 0 681 343 009 assembly 3rd speed 1/min: 600 Sleeve travel mm: 3.00...3.50
4th speed 1/min: 1195
Sleeve travel mm: 8.40...8.50
5th speed 1/min: 1235
Sleeve travel mm: 8.90...9.10 Opening pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 SLEEVE POSITION Outside diameter x Wall thickness Control-lever position : 6.00X2.00X600 Degree: -1 x Length mm 17min: 1190 Speed Cont.-rod travelmm: 15.20...\$.80 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. FULL-LOAD DELIV. AT FULL-LOAD STOP per values ____ 1st version START OF DELIVERY 1/min: 1150 Speed Del.quantity cm3/: 72.0...74.0 1090H:: (70.0...76.0) Dispersion cm3/: 3.50 1000H:: (6.00) Test pressure, bar: 25...27 : 1.50...1.60 Prestroke mm : (1.45...1.65) Contr.-rod trav.mm: 9.00...12.00

L01

HIGHEST RATED SPEED 1st version Control-lever position degrees: 61...69 Testing: 1st c-rod trav.mm : 7.30 Speed 1/min: 1190...1200 2nd c-rod trav.mm : 4.00 1/min : 1220...1250 4th speed 1/min: 1350 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 68...76 Testing: Speed 1/min : 100 C-rod trav.mm min: 8.00 Speed 1/min: 300 C-rod trav.mm : 6.40...6.60 CONSTANT REGULATION 1/min : 320...420 Speed TORQUE CONTROL Dimension a mm : 1.00 Torque-control curve - 1st version 1st speed 1/min : 1150 C-rod trav.mm : 8.30...8.40 2nd speed 1/min : 500 C-rod trav.mm : 9.30...9.40 3rd speed 1/min : 935 C-rod trav.mm : 9.00...9.20 4th speed 1/min : 1045 C-rod trav.mm : 8.50...8.70 SWITCH-OVER POINT 1/min : 220 (240) Speed FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 800 Del.quantity cm3/: 78.0...81.0 1000H: (75.5...83.5) 1/min : 800 Speed ! Del.quantity cm3/ : 93.5...101.5 1000H.: (96 J...104.0) STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 120.0...130.0 1000H.: (117.0...133.0)

Contr.-rod trav.mm: 14.40...14.80

L02

On activation of the starting solenoid,

the start position must be reached.

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

When accelerating from engine speed "O", no voltage in starting solenoid. APPLICATION Below-ground operation

```
: 1-8-7-2-6-5-
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Cam sequence
Note inst. in remarks column
Test sheet
Edition
Superceeded
                    : KHD 12,7 N1
                    : 12.09.86
                                                       SD ang. spacing CS: 0-45-90-135-180-225-
                    : 10.85
                                                                             270-315
                                                       Tolerance + - 0
                                                                           : 0.50 (0.75)
Calibrating oil : ISO-4113
Combination no.
                    : 0 400 648 124
                                                       SD mark cyl. no. : 1
Injection pump
                                                       BASIC SETTING
Pump designation : PE8A95D410LS2588
EP type number : 0 410 698 989
                                                       1st speed
                                                                      1/mi: 1150
Governor
                                                       Contr.-rod trav.mm: 9.30...9.40
Governor design.: RQV300...1150AB1088
Governer no. : 0 420 212 115
                                                       Del.quantity cm3/ : 7.1...7.3
Customer-spec. information
                                                                     100H.: (6.9...7.5)
Customer
                    : KHD
                                                                     cm3/:0.3
Engine
                    : F8L413FW
                                                       Dispersion
1st version kW : 153.0
                                                                     100H.: (0.6)
             1/min: 2300
Speed
                                                                     1/min: 300.0
                                                      2nd speed
TEST BENCH REQUIREMENTS
                                                       Contr.-rod trav. m: 6.2...6.4
                                                      Del.quantity cm3/: 1.4...2.0
100H.: (1.1...2.2)
Dispersion cm3/: 0.3
100H.: (0.5)
Calibrating-oil inlet temp. °C
                    : 38...42
Overflow valve
                    : 1 417 413 000
                                                       (B) Setting of injection pump with
                                                           externally-mounted governor
Inlet press., bar: 1.00
                                                      SLEEVE TRAVELS
                                                      1st speed 1/min: 300
Sleeve travel mm: 1.20...1.30
2nd speed 1/min: 400
Sleeve travel mm: 2.20...2.60
Calibrating nozzle-holder
               : 0 681 343 009
 assembly
Opening
 pressure, bar : 172...175
                                                       3rd speed 1/min: 600
                                                         Sleeve travel mm: 3.00...3.50
                                                       4th speed 1/min: 1195
                                                         Steeve travel mm: 8.50...8.50
Test inj. tubing : 1 680 750 014
                                                      5th speed 1/min: 1245
Sleeve travel mm: 9.10...9.30
Outside diameter
x Wall thickness
                  : 6.00x2.00x600
                                                      SLEEVE POSITION
x Length mm
                                                      Control-lever position
                                                                    Degree: -1
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                                    17min: 1200
                                                      Speed
                                                      Cont.-rod travelmm: 15.20...17.80
    per values ____
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
START OF DELIVERY
Test pressure, bar: 25...27
                                                      1st version
                                                                     1/min: 1150
                                                      Speed
                                                      Del.quantity cm3/: 71.0...73.0
1000H.: (69.0...75.0)
Prestroke mm
                    : 1.50...1.6C
                    : (1.45...1.65)
Contr.-rod trav.mm: 9.00...12.00
L03
```

Dispersion cm3/ : 3.50 1000H.: (6.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 61...69 Testing: 1st c-rod trav.mm : 8.30 Speed 1/min: 1190...1200 2nd c-rod trav.mm : 4.00 1/min : 1230...1260 1/min : 1350 Speed 4th speed C-rod trav.mm : 0.001.00 LOWEST RATED SPEED I Control-lever position degrees: 8...16 Testing: Speed 1/min: 100 C-rod trav.mm min: 7.80 Speed 1/min: 300 : 6.20...6.40 C-rod trav.mm CONSTANT REGULATION 1/min: 320...430 Speed TORQUE CONTROL Dimension a mm : 1.00 Torque-control curve - 1st version 1st speed 1/min : 1150 C-rod trav.mm : 9.30...9.40 2nd speed 1/min: 500 C-rod trav.mm \$ 10.30...10.40 3rd speed 1/min : 935 C-rod trav.mm : 10.00...10.20 4th speed 1/min: 1045 C-rod trav.mm : 9.50...9.70 SWITCH-OVER DINT 1/min : 220 (240) Speed FUEL-DELIVERY CHARACTERISTICS 1/min : 800 Speed Del.quantity cm3/: 77.5...80.5 1000H.: (75.0...83.0) Speed 1/min: 800 Del.quantity cm3/: 98.5...101.5 1000H.: (96.0...104.0) STARTING FUEL DELIVERY

1/min : 100

Del.quantity cm3/: 120.0...130.0 1000H.: (117.0...133.0) Contr.-rod trav.mm: 15.40...15.80

Speed

L04

On activation of the starting solenoid, the start position must be reached.

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

When accelerating from engine speed "O", no voltage in starting solenoid. APPLICATION Below-ground operation

```
: 1-8-7-2-6-5-
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     Cam sequence
Note inst. in remarks column
Test sheet
                    : KHD 12,7 P4
Edition
                    : 15.05.87
                                                     SD ang. spacing CS: 0-45-90-135-180-225-
Superceeded
                                                                           270-315
                                                     Tolerance + - 0
Calibrating oil : ISO-4113
                                                                         : 0.50 (0.75)
Combination no.
                    : 0 400 648 145
                                                     SD mark cyl. no. : 1
Injection pump
                                                     BASIC SETTING
Pump designation : PE8A95D410LS2608
EP type number : 0 410 698 983
                                                     1st speed
                                                                    1/mi: 1100
Governor
Governor design.
                                                     Contr.-rod trav.mm: 10.00...10.10
                    : RQ300/1100AB1230L
Governer no.
                   : 0 420 200 108
                                                     Del.quantity cm3/: 8.9...9.1
Customer-spec. information
                                                                   100H.: (8.7...9.3)
Customer
                   : KHD
Engine
                    : F8L413F
                                                     Dispersion
                                                                   cm3/:0.3
1st version kW : 162.0
                                                                   100H.: (0.6)
Speed
              1/min: 2200
                                                                   1/min: 300.0
                                                     2nd speed
TEST BENCH REQUIREMENTS
                                                     Contr.-rod trav. m: 6.4...6.6
                                                     Del.quantity cm3/: 1.0...1.6
100H.: (0.7...1.8)
Dispersion cm3/: 0.5
100H.: (0.7)
Calibrating-oil inlet temp. OC
                    : 38...42
Overflow valve
                    : 1 417 413 000
                                                     SLEEVE POSITION
                                                     Control-lever position
Inlet press., bar : 1.00
                                                                  Degree: -1
                                                                   17min: 550
                                                     Speed
                                                     Cont.-rod travelmm: 15.60...16.40
Calibrating nozzle-holder
 assembly
                   : 0 681 343 009
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
 pressume, bar
                  : 172...175
                                                     1st version
                                                     Speed
                                                                   1/min: 1100
                                                     Del.quantity cm3/: 89.0...91.0
1000H.: (87.0...93.0)
Dispersion cm3/: 3.50
Test inj. tubing : 1 680 750 014
                                                                  1000H.: (6.00)
Outside diameter
x Wall thickness
                                                     HIGHEST RATED SPEED
                : 6.00x2.00x600
x Length mm
(A) Injection pump setting values
                                                     Setting point:
    Insp. values in parentheses
                                                                 1/min : 550
                                                     Speed
    Set constant delivery quant.
                                                     Contr.-rod trav.mm: 16.0
    per values
                                                     Testing:
                                                     1st c-rod trav.mm : 9.00
Speed 1/min : 1145...1160
2nd c-rod trav.mm : 4.00
START OF DELIVERY
Test pressure, bar: 25...27
                    : 2.00...2.10
                                                       Speed
                                                                  1/min : 1205...1235
Prestroke mm
                   : (1.95...2.15)
Contr.-rod trav.mm: 9.00...12.00
                                                     LOWEST RATED SPEED I
L05
```

```
Setting point w/out aux. spring
Speed 1/min : 300
Contr.-rod trav.mm: 6.5
Testing:
            1/min : 100
Speed
C-rod trav.mm min: 8.00
           1/min : 300
Speed
               : 6.40...6.60
C-rod trav.mm
                : 2.00
C-rod trav.mm
           1/min: 355...395
Speed
TORQUE CONTROL
Dimension a mm : 0.25
Torque-control curve - 1st version
1st speed 1/min : 1100
  C-rod trav.mm : 10.00...10.10
2nd speed 1/min : 550
C-rod trav.mm : 10.50...10.60
3rd speed 1/min : 785
 C-rod trav.mm : 10.30...10.50
4th speed 1/min: 915
  C-rod trav.mm : 10.10...10.30
FUEL-DELIVERY CHARACTERISTICS
Speed 1/min : 650
Del.quantity cm3/: 90.5...93.5
            1000H.: (88.0...96.0)
STARTING FUEL DELIVERY
            1/min : 100
Speed
Del.quantity cm3/: 120.0...130.0
            1000H.: (117.0...133.0)
Contr.-rod trav.mm: 14.70...15.70
         1 111111111
Remarks: 1
```

BOSCH INJ. PUMP TEST SPECIFICATIONS Contr.-rod trav.mm: 9.00...12.00 : 1-10- 9- 4- 3- 6-5- 8- 7- 2 Cam sequence Note inst. in remarks column Test sheet : KHD 15,8 N1 Edition : 15.05.87 Superceeded : 10.85 SD ang. spacing CS: 0-27-72-99-144-171-Calibrating oil : ISO-4113 216-243-288-315 Tolerance + - 0 : 0.50 (0.75) Combination no. : 0 400 649 219 SD mark cyl. no. : 1 Injection pump Pump designation : PE10A95D610/4LS2589 BASIC SETTING EP type number : 0 410 699 994 1/mi: 1150 Governor 1st speed Governor design. : RQV300...1150AB1047D Contr.-rod trav.mm: 9.30...9.40 Governer no. : 0 420 214 242 Del.quantity cm3/: 6.9...7.1 Customer-spec. information 100H.: (6.7...7.3) Customer : F10L413 cm3/:0.3Engine Dispersion 1st version kW : 192.0 100H.: (0.6) 1/min: 2300 Speed 2nd speed 1/min: 300.0 Contr.-rod trav. m: 7.2...7.4

Del.quantity cm3/: 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm3/: 0.3

100H.: (0.5) TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 000 (B) Setting of injection pump with externally-mounted governor Inlet press., bar: 1.00 SLEEVE TRAVELS 1st speed 1/min: 300 Sleeve travel mm: 1.20...1.30 2nd speed 1/min: 400 Calibrating nozzle-holder : 0 681 343 009 assembly Sleeve travel mm: 2.20...2.60 Opening pressure, bar : 172...175 1/min: 600 3rd speed Sleeve travel mm: 3.00...3.50 4th speed 1/min: 1195 Sleeve travel mm: 8.40...8.50 Test inj. tubing : 1 680 750 014 5th speed 1/min: 1235 Sleeve travel mm: 9.10...9.30 Outside diameter x Wall thickness SLEEVE POSITION : 6.00x2.00x600 x Length mm Control-lever position (A) Injection pump setting values Degree: -1 17min: 1190 Insp. values in parentheses Set constant delivery quant. Speed Cont.-rod travelmm: 15.20...17.80 per values ____ FULL-LOAD DELIV. AT FULL-LOAD STOP START OF DELIVERY Test pressure, bar: 25...27 1st version 1/min: 1150 Speed Del.quantity cm3/: 69.0...71.0 1000H.: (67.0...73.0) : 1.50...1.60 Prestroke mm : (1.45...1.65)

L07

```
Dispersion cm3/ : 3.50
             1000H.: (6.00)
HIGHEST RATED SPEED
1st version
Control-lever
 position degrees: 61...69
Testing:
1st c-rod trav.mm : 8.30
  Speed 1/min: 1190...1200
2nd c-rod trav.mm: 4.00
             1/min : 1230...1260
1/min : 1350
  Speed
4th speed
  C-rod trav.mm : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 10...18
Testing:
Speed 1/min: 100
C-rod trav.mm min: 7.80
Speed 1/min: 300
C-rod trav.mm: 7.20...7.40
CONSTANT REGULATION
             1/min : 320...430
Speed
TORQUE CONTROL
Dimension a mm : 1.00
Torque-control curve - 1st version
1st speed 1/min : 1150
  C-rod trav.mm : 9.30...9.40
2nd speed 1/min: 500
 C-rod trav.mm : 10.30...10.40
3rd speed 1/min : 935
C-rod trav.mm : 10.00...10.20
4th speed 1/min : 1045
  C-rod trav.mm : 9.50...9.70
SWITCH-OVER POINT
Speed
             1/min : 220 (240)
FUEL-DELIVERY CHARACTERISTICS
Speed 1/min: 800
Del.quantity cm3/: 75.5...78.5
1000H.: (73.0...81.0)
             1/min : 800
Speed
Del.quantity cm3/: 98.5...101.5
             1000H.: (96.0...104.0)
STARTING FUEL DELIVERY
Speed
             1/min : 100
Del.quantity cm3/: 120.0...130.0
             1000H.: (117.0...133.0)
Contr.-rod trav.mm: 15.40...15.80
```

L08

Remarks: On activation of the starting solenoid, the start position must be reached.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                        SD ang. spacing ^{\circ} CS: 0-60-120-180-249-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Test sheet
Edition
Superceeded
                   : STE 6,0 H 6
                   : 12.09.86
                   : 10.84
                                                        BASIC SETTING
Calibrating oil : ISO-4113
                                                        1st speed
                                                                        1/mi: 1400
                    : 0 400 656 159
Combination no.
                                                        Contr.-rod trav.mm: 14.20...14.30
Injection pump
Pump designation : PE6A85D412RS2303Y
                                                        Del.quantity cm3/: 9.6...9.7
EP type number : 0 410 686 940
                                                                       100H.: (9.4...9.9)
Governor
Governor design. : RQV250...1400AB879DL
                   : 0 420 214 186
                                                                       cm3/:0.3
Governer no.
                                                        Dispersion
                                                                       100H.: (0.4)
Customer-spec. information
Customer
                    : STEYR
                                                        2nd speed 1/min: 250.0
Contr.-rod trav. m: 8.9...9.1
Del.quantity cm3/: 1.0...1.5
100H.: (0.8...1.7)
Engine
                     : WD612.90
1st version kW
                   : 154.0
                                                                       cm3/: 0.2
100H.: (0.4)
                                                        Dispersion
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                                                        SLEEVE POSITION
                     : 38...42
                                                        Control-lever position
                                                                      Degree: -1
17min: 1450
Overflow valve
                     : 1 417 413 000
                                                        Cont.-rod travelmm: 15.20...17.80
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar: 1.00
Calibrating nozzle-holder
                                                        1st version
                                                        Speed 1/min: 1400
Charge press. hPa: 700
Del.quantity cm3/: 96.0...97.0
1000H.: (94.0...99.0)
Dispersion cm3/: 3.00
1000H.: (4.50)
              : 0 681 343 009
 assembly
Opening
pressure, bar : 172...175
Test inj. tubing : 1 680 750 014
                                                        HIGHEST RATED SPEED
Outside diameter
                                                        1st version
x Wall thickness
                                                        Control-lever
x Length mm
                    : 6.00x2.00x600
                                                         position degrees: 43...51
(A) Injection pump setting values
                                                        Testing:
    Insp. values in parentheses
                                                        1st c-rod trav.mm : 13.20
    Set constant delivery quant.
                                                          Speed 1/min: 1440...1450
                                                        2nd c-rod trav.mm: 4.00
    per values
                                                        Speed 1/min: 1580...1610
3rd c-rod trav.mm: 0.00...1.00
START OF DELIVERY
                                                                    1/min : 1700
Test pressure, bar: 25...27
                                                          Speed
                     : 2.50...2.60
Prestroke mm
                                                        LOWEST RATED SPEED I
                    : (2.45...2.65)
                                                        Control-lever
                                                         position degrees: 9...17
Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 1-5- 3- 6- 2- 4
```

L09

```
Testing:
             1/min : 100
Speed
C-red trav.mm min: 10.40
             mm : 2.00

1/min : 380...440

1/min : 500
C-rod trav.mm
Speed
Speed
C-rod trav.mm max: 1.00
CONSTANT REGULATION
Speed
             1/min : 340...450
 compensator (LDA, ADA, ALDA)
1st version
Setting
              1/min : 1400
Speed
             hPa : 700
Pressure
Contr.-rod trav.mm: 14.20...14.30
Measurement
             1/min : 1400
Speed
1st pressure hPa : -
                    : 12.50...12.60
  C-rod trav.mm
2nd pressure hPa : 240
  C-rod trav.mm : 13.80...13.90
3rd pressure hPa : 220
  C-rod trav.mm : 12.90...13.10
SWITCH-OVER POINT
             1/min : 170 (190)
Speed
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa: 700
             1/min : 800
Speed
Del.quantity cm3/: 91.5...94.5
1000H.: (89.5...96.5)
             cm3/: 4.00
1000H.: (5.50)
Dispersion
Charge press, hPa: -
Speed 1/min: 5
             1/min : 500
Del.quantity cm3/: 60.5...63.5
1000H.: (58.5...65.5)
             cm3/: 4.00
1000H.: 5.50
Dispersion
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75) Note inst. in remarks column Test sheet : HAN 7,2 B 1 : 13.05.87 Edition SD mark cyl. no. : 1 Superceeded Calibrating oil : ISO-4113 BASIC SETTING Combination no. : 0 400 674 045 1/mi: 1080 1st speed Contr.-rod trav.mm: 11.00...11.10 Injection pump Pump designation : PE4A9SD42ORS2662-1 Del.quantity cm3/: 10.6...10.8 EP type number : 0 10 694 994 Governor 100H.: (10.4...11.0) Governor design. : RSV350...1100A8C2222 : 0 420 232 487 cm3/:0.3Governer no. Dispersion Customer-spec. information 100H.: (0.6) Customer : HANOMAG 2nd speed 1/min: 350.0 Contr.-rod trav. m: 7.4...7.6 Del.quantity cm3/: 3.2...3.8 100H.: (2.9...4.0) : D944 T Engine 1st version kW : 93.0 cm3/: 0.3 100H.: (0.5) 1/min: 2200 Speed Dispersion TEST BENCH REQUIREMENTS SLEEVE POSITION Control-lever position Calibrating-oil inlet temp. °C Degree: -3 1/min: 800 : 38...42 Cont.-rod travelmm: 0.30...0.70 Inlet press., bar: 1.00 Governor-spring reload Notch setting x : 3.75 Calibrating nozzle-holder : 0 681 343 009 assembly FULL-LOAD DELIV. AT FULL-LOAD STOP Opening : 172...175 pressure, bar 1st version 1/min: 1080 Speed Del.quantity cm3/: 106.0...108.0 : 1 680 750 003 Test inj. tubing 1000H.: (104.0...110.0) cm3/: 3.50 1000H.: (6.00) Outside diameter Dispersion x Wall thickness : 6.00x2.00x600 x Length mm HIGHEST RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set constant delivery quant. Control-lever position degrees: 44...52 per values Testing: 1st c-rod trav.mm : 10.00 Speed 1/min : 1120...1130 START OF DELIVERY Test pressure, bar: 25...27 2nd c-rod trav.mm: 4.00 1/min : 1140...1175 Prestroke mm : 2.15...2.25 Speed 3rd c-rod trav.mm: 4.00 : (2.10...2.30) 1/min: 1165...1195 Contr.-rod trav.mm: 9.00...12.00 Speed Cam sequence : 1- 2- 4- 3 1/min : 1340 4th speed C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I Control-lever position degrees: 13...21 Setting point w/out aux. spring Speed 1/min: 350 Contr.-rod trav.mm: 7.0 Testing: 1/min: 100 Speed C-rod trav.mm min : 19.50 1/min : 350 Speed C-rod trav.mm : 7.40...7.60 C-rod trav.mm : 2.00 1/min: 490...550 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 1080 1st speed C-rod trav.mm : 11.00...11.10 2nd speed 1/min: 500 C-rod trav.mm : 11.90...12.00 4th speed 1/min: 670 C-rod trav.mm : 11.40...11.70 FUEL-DELIVERY CHARACTERISTICS 1/min : 500 Speed Del.quantity cm3/: 109.0...112.0 1000H.: (106.5...114.5) STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 132.0...142.0 1000H:: (129.0...145.0) Contr.-rod trav.mm: 19.50...21.00

Cam sequence : 1- 3- 4- 2 BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column Test sheet : LIE 5.6 B Edition : 13.05.87 Superceeded : 12.9.86 SD ang. spacing $^{\circ}$ CS: 0-90-180-270 Tolerance + - $^{\circ}$: 0.50 (0.75) Calibrating oil : ISO-4113 START OF DELIVERY DIFFERENCE betw.c-rod trav.mm: 9.00...12.00 Difference CS : 4.00...5.00 Combination no. : 0 400 844 085 Injection pump Pump designation : PES4A100D410RS2686 BASIC SETTING EP type number : 0 410 804 001 1/mi: 1000 Governor 1st speed Governor design. : RQV408...1000AB1203L Governer no. : 0 420 212 177 Contr.-rod trav.mm: 12.50...12.60 Del.guantity cm3/: 12.1...12.3 Customer-spec. information Customer : LIEBHERR 100H.: (11.9...12.5) Engine : D904T cm3/:0.3Dispersion 1st version kW : 100.0 1/min: 2000 100H.: (0.6) Speed TEST BENCH REQUIREMENTS 1/min: 400.0 2nd speed Contr.-rod trav. m: 7.4...7.6

Del.quantity cm3/: 1.5...2.1
100H.: (1.2...2.3)

Dispersion cm3/: 0.3
100H.: (0.5) Calibrating-oil inlet temp. ^DC : 40...45 Overflow valve : 1 417 413 000 (B) Setting of injection pump with externally-mounted governor Inlet press., bar: 1.50 Calibrating nozzle-holder SLEEVE TRAVELS : 0 681 343 009 assembly 1st speed 1/min: 450 Sleeve travel mm: 4.20...4.40
2nd speed 1/min: 580
Sleeve travel mm: 3.60...3.90
3rd speed 1/min: 1040
Sleeve travel mm: 7.80...7.90 Opening pressure, bar : 172...175 4th speed 1/min: 1140 Test inj. tubing : 1 680 750 008 Sleeve travel mm: 9.00...9.20 Outside diameter x Wall thickness SLEEVE POSITION : 6.00x2.00x600 Control-lever position x Length mm Degree: 1 1/min: 1000 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Cont.-rod travelmm: 15.20...17.80 FULL-LOAD DELIV. AT FULL-LOAD STOP per values ____ START OF DELIVERY 1st version 1/min: 1000 Test pressure, bar: 25...27 Speed Charge press. hPa: 800
Del.quantity cm3/: 121.5...123.5
1000H.: (119.5...125.5) Prestroke mm : 2.70...2.80 : (2.65...2.85) Contr.-rod trav.mm: 9.00...12.00

L13

Dispersion cm3/ : 3.50 1000H.: (6.00) HIGHEST RATED SPEED 1st version Control-lever position degrees: 58...66 Testing: 1st c-rod trav.mm: 11.50 1/min : 1040...1050 Speed 2nd c-rod trav.mm : 4.00 1/min : 1125...1155 Speed 3rd c-rod trav.mm : 4.00 4th speed 1/min: 1250 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 9...17 Testing: 1/min : 100 Speed C-rod trav.mm min: 8.50 Speed 1/min : 400 : 6.90...7.10 C-rod tray.mm CONSTANT REGULATION 1/min : 435...540 Speed TORQUE CONTROL : 1.30 Dimension a mm Torque-control curve - 1st version 1/min : 1000 1st speed C-rod trav.mm : 12.50...12.60 2nd speed 1/min: 500 C-rod trav.mm : 13.80...13.90 4th speed 1/min: 860 : 13.30...13.50 C-rod trav.mm 5th speed 1/min: 920 : 12.90...13.10 C-rod trav.mm compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 Speed hPa : 800 Pressure Contr.-rod trav.mm: 13.80...13.90 Measurement 1/min : 500 Speed 1st pressure hPa : : 12.70...12.80 C-rod trav.mm 2nd pressure hPa : 655 : 13.60...13.70 C-rod trav.mm 3rd pressure hPa : 610 C-rod trav.mm : 13.00...13.20 L14

SWITCH-OVER POINT 1/min: 320 (340) Speed FUEL-DELIVERY CHARACTERISTICS Charge press. hPa: 800

Speed 1/min : 650 Del.quantity cm3/: 133.5...136.5 1000H.: (131.0...139.0)

Charge press. hPa : -1/min: 500 Speed Del.quantity cm3/: 104.0...107.0 1000H.: (102.0...109.0)

STARTING FUEL DELIVERY

Speed 1/min : 100 Del.quantity cm3/: 113.0...123.0 1000H.: (110.0...126.0) Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

1/min : 400 Speed Contr.-rod trav.mm: 7.40...7.60 Del.quantity cm3/: 15.0...21.0 1000H: (12.5...23.5) Dispersion cm3/: 3.50

1000H.: (5.50)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 9.2 0 3
Edition : 30.03.87
Superceeded : 12.9.86 Calibrating oil : ISO-4113

Combination no. : 0 400 845 072

Injection pump

Pump designation : PES5A95D410LS2543

EP type number : 0 410 895 978

Governor

Governor design. : RQV250...1100AB1177-

1L

Governer no. : 0 420 212 163

Customer-spec. information Customer

: D2565 M/MF Engine

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant.

per values

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60

: (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 3- 5- 4-

Testing: SD ang. spacing 0 CS: 0-72-144-216-288 Tolerance + - : 0.50 (0.75) 1st c-rod trav.mm : 10.00 Speed 1/min : 1140...1150 2nd c-rod trav.mm : 4.00 Speed 1/min: 1180...1210 4th speed 1/min: 1300 SD mark cyl. no. : 5 C-rod trav.mm : 0.00...1.00 BASIC SETTING LOWEST RATED SPEED I 1/mi: 1100 1st speed Control-lever Contr.-rod trav.mm: 11.00...11.10 position degrees: 8...16 Del.quantity cm3/ : 11.0...11.2 Testing: Speed 1/min : 100 C-rod trav.mm min: 8.10 100H.: (10.8...11.4) Speed 1/min : 250 C-rod trav.mm : 6.50...6.70 C-rod trav.mm : 2.00 cm3/:0.3Dispersion 1/min: 335...395 100H.: (0.6) Speed TORQUE CONTROL 1/min: 250.0 2nd speed Contr.-rod trav. m: 6.5...6.7 Dimension a mm : 0.35 Del.quantity cm3/: 0.8...1.4 100H.: (0.5...1.6) Torque-control curve - 1st version 1/min : 1100 1st speed cm3/: 0.3 100H.: (0.5) C-rod trav.mm : 11.00...11.10 Dispersion 2nd speed 1/min: 500 C-rod trav.mm : 11.40...11.50 4th speed 1/min : 900 (B) Setting of injection pump with C-rod trav.mm : 11.10...11.40 externally-mounted governor SWITCH-OVER POINT SLEEVE TRAVELS Speed 1/min : 170 (190) 1st speed 1/min: 150 Sleeve travel mm: 0.40...0.70 2nd speed 1/min: 550
Sleeve travel mm: 3.60...4.00
3rd speed 1/min: 900
Sleeve travel mm: 5.60...6.10 FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 500
Del.quantity cm3/: 0.0...111.5
1000H.: (0.0...113.5)
Speed 1/min: 750 4th speed 1/min: 1200 Sleeve travel mm: 9.50...10.30 Del.quantity cm3/: 106.5...110.5 1000H.: (104.5...112.5) SLEEVE POSITION Control-lever position Degree: -1 1/min: 1140 STARTING FUEL DELIVERY Speed Cont.-rod travelmm: 15.20...17.80 Speed 1/min : 100 Del.quantity cm3/: 146.5...156.5 1000H.: (143.5...159.5) FULL-LOAD DELIV. AT FULL-LOAD STOP Contr.-rod trav.mm: 16.90...17.50 1st version Speed 1/min: 1100
Del.quantity cm3/: 110.5...112.5
1000H.: (108.5...114.5)
Dispersion cm3/: 3.50 Remarks: Set idle stop at 250 min. -1 control-rod travel of 6.5 mm to a 1000H.: (6.00) HIGHEST RATED SPEED 1st version Control-lever

position degrees: 42...50

```
: 1-5-3-6-2-4
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                         Cam sequence
Note inst. in remarks column
Test sheet
                                                         SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                     : OMB 8,1 A 1
Edition
                    : 26.06.87
Superceeded
                     : 5.84
                   : ISO-4113
                                                         SD mark cyl. no. : 1
Calibrating oil
Combination no.
                    : 0 400 846 396
                                                         BASIC SETTING
Injection pump
                                                         1st speed
                                                                         1/mi: 1300
                    : PES6A90D410RS2494
Pump designation
EP type number
                                                         Contr.-rod trav.mm: 13.20...13.30
                    : 0 410 896 057
Governor
Governor design. : RQ275/1300AB969DL
Governer no. : 0 420 202 278
                                                         Del.quantity cm3/: 8.0...8.1
                                                                        100H.: (7.8...8.3)
Customer-spec. information
Customer
                     : IVECO-OM
                                                         Dispersion
                                                                        cm3/:0.3
Engine
                     : 8360.05.200
                                                                        100H.: (0.4)
1st version kW : 117.7
                                                                        1/min: 275.0
                                                         2nd speed
                                                        Contr.-rod trav. m: 8.3...8.5

Del.quantity cm3/: 0.4...0.9

100H.: (0.2...1.1)

Dispersion cm3/: 0.4

100H.: (0.4)
Speed
               1/min: 2600
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. C
                     : 38...42
                                                         SLEEVE POSITION
Overflow valve
                                                         Control-lever position
                     : 1 417 413 000
                                                                      Degree: -1
                                                         Speed
                                                                       17min: 900
                                                         Cont.-rod travelmm: 13.60...15.00
Inlet press., bar: 1.00
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzle-holder
 assembly
                    : 0 681 343 009
                                                         1st version
                                                                        1/min: 1300
Opening.
                                                         Speed
                                                        Del.quantity cm3/: 80.0...81.0
1000H: (78.0...83.0)
Dispersion cm3/: 3.00
 pressure, bar
                    : 172...175
                                                                      1000H.: (4.50)
                    : 1 680 750 014
Test inj. tubing
                                                        HIGHEST RATED SPEED
Outside diameter
x Wall thickness
                    : 6.00x2.00x600
x Length mm
                                                         Setting point:
                                                         Speed 3
                                                                    1/min : 900
                                                         Contr.-rod trav.mm: 14.3
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                         Testing:
                                                        1st c-rod trav.mm : 12.20
Speed 1/min : 1345...1360
2nd c-rod trav.mm : 4.00
    per values ____
START OF DELIVERY
                                                                      1/min : 1440...1470
Test pressure, bar: 25...27
                                                           Speed
                                                                      1/min : 1600
                                                         4th speed
Prestroke mm
                     : 2.15...2.25
                                                                             : 0.00...1.00
                                                           C-rod trav.mm
                     : (2.10...2.30)
Contr.-rod trav.mm: 9.00...12.00
                                                        LOWEST RATED SPEED I
L17
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Setting point w/out aux. spring Speed 1/min : 275 Contr.-rod trav.mm: 5.8 Testing: Speed 1/min: 100 C-rod trav.mm min: 7.30 Speed 1/min : 275 C-rod trav.mm : 5.70...5.90 : 2.00 C-rod trav.mm 1/min: 420...480 Speed 1/min : 600 Speed C-rod trav.mm max: 1.00 TORQUE CONTROL Torque-control curve - 1st version 1/min : 1300 1st speed C-rod trav.mm : 13.20...13.30 2nd speed 1/min: 500 C-rod trav.mm : 13.80...13.90 3rd speed 1/min: 700 : 13.70...13.90 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS Speed 1/min : 500 Del.quantity cm3/: 71.5...74.5 1000H.: (69.0...77.0) 1/min : 700 Speed Del.quantity cm3/: 77.5...80.5 1000H.: (75.0...83.0) STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 112.0...122.0 1000H.: (109.0...125.0) Contr.-rod trav.mm: 19.50...21.00 Remarks: Check electrically unlatched starting fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 1.50...1.60 Prestroke mm : (1.45...1.65) Note inst. in remarks column Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5-3-6-2-4 Test sheet : MAN 11_1P14 : 12.09.86 : 10.85 Edition Superceeded SD ang. spacing 0 CS: 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Calibrating oil : ISO-4113 Combination no. : 0 400 846 419 SD mark cyl. no. : 6 Injection pump Pump designation : PES6A95D410LS2542 BASIC SETTING EP type number : 0 410 896 936 1/mi: 1100 Governor 1st speed Governor design. : RQ250/1100AB965DL Governer no. : 0 420 202 270 Contr.-rod trav.mm: 12.00...12.10 Customer-spec. information Del.quantity cm3/: 12.4...12.6 Customer 100H.: (12.2...12.8) Engine : D2566 M/MF cm3/:0.3Dispersion 1st version kW : 176.5 Speed 1/min: 2200 100H.: (0.6) 2nd version kW : 168.0 2nd speed 1/min: 250.0 Contr.-rod trav. m: 5.9...6.1 Speed 1/min: 1500 Del.quantity cm3/: 0.8...1.4 TEST BENCH REQUIREMENTS 100H.: (0.5...1.6) cm3/: 0.3 Calibrating-oil inlet temp. OC Dispersion 100H.: (0.5) : 38...42 SLEEVE POSITION Overflow valve : 1 417 413 000 Control-lever position Degree: -1 1/min: 600 Inlet press., bar: 1.00 Speed Cont.-rod travelmm: 15.60...16.40 Calibrating nozzle-holder : 0 681 343 009 FULL-LOAD DELIV. AT FULL-LOAD STOP assembly Opening. 1st version Speed 1/min: 1100
Del.quantity cm3/: 124.5...126.5
1000H.: (122.5...128.5)
Dispersion cm3/: 3.00 pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 1000H.: (6.00) Outside diameter 2nd version x Wall thickness 1/min: 1100 Speed Del.quantity cm3/: 118.0...120.0 * : 6.00x2.00x600 x Length mm 1000H.: (116.0...122.0) (A) Injection pump setting values HIGHEST RATED SPEED Insp. values in parentheses Set constant delivery quant. per values Setting point: Speed 1/min : 600 START OF DELIVERY Contr.-rod trav.mm: 16.0 Test pressure, bar: 25...27 Testing: 1st c-rod trav.mm : 11.00

Speed 1/min : 1145...1160 2nd c-rod trav.mm: 4.00 1/min: 1185...1215 Speed 1/min : 1300 4th speed C-rod tray.mm : 0.00...1.00 Setting point: Speed] 1/min : 600 Contr.-rod trav.mm: 16.0 Testing: 1st c-rod trav.mm : 11.00 1/min: 1145...1160 Speed 2nd c-rod trav.mm : 4.00 1/min : 1185...1215 1/min : 1300 Speed 4th speed : 0.00...1.00 C-rod trav.mm LOWEST RATED SPEED I Setting point w/out aux. spring Speed 1/min : 250 Contr.-rod trav.mm: 6.0 Testing: 1/min : 100 Speed C-rod trav.mm min : 7.50 1/min : 250 Speed : 5.90...6.10 C-rod trav.mm : 2.00 C-rod trav.mm Speed 1/min: 360...420 1/min : 500 Speed C-rod trav.mm max: 1.00 TORQUE CONTROL Torque-control curve - 1st version 1/min : 1100 1st speed C-rod trav.mm : 12.00...12.10 2nd speed 1/min: 500 : 12.00...12.20 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS 1/min : 500 Speed Del.quantity cm3/: 107.5...113.5 1000H.: (105.0...116.0) 1/min : 750 Speed Del.quantity cm3/: 110.5...113.5 1000H.: (108.0...116.0) 1/min : 500 Speed Del.quantity cm3/: 102.0...108.0 * 1000H.: (100.0,..110.0) 1/min: 750 Speed Del.quantity cm3/: 106.0...109.0 * 1000H.: (104.0...111.0) STARTING FUEL DELIVERY

Del.quantity cm3/: 125.0...135.0 1000H.: (122.0...138.0) Contr.-rod trav.mm: 14.00...14.60

Remarks:

: MAN-NR. 2-7283

Speed

1/min : 100

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : RAB 9.7 B 1 : 13.05.87

Calibrating oil : ISO-4113

Combination no. : 0 400 846 543

Injection pump

Pump designation : PES6A95D420LS2595

: 0 410 896 930 EP type number

Governor

Governor design. : RQ200/1100AB1210R

Governer no. : 0 420 201 643

Customer-spec. information Customer : RABA

: D2156MT6U Engine

1st version kW : 188.0 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values

START OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.05)

Contr.-rod trav.mm: 9.00...12.00

```
Speed 1/min: 100
C-rod trav.mm min: 7.60
Speed 1/min: 200
Cam sequence : 1-5-3-6-2-4
                                                  1
                                                       C-rod trav.mm : 6.30...6.50
SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.50 (0.75)
                                                                           : 2.00
                                                       C-rod trav.mm
                                                                   1/min : 320...360
                                                       Speed
                                                                    1/min : 450
                                                       Speed
SD mark cyl. no. : 1
                                                       C-rod trav.mm max: 1.00
BASIC SETTING
                                                       TORQUE CONTROL
                                                       Dimension a mm : 1.20
1st speed 1/mi: 1100
                                                       Torque-control curve - 1st version
                                                       1st speed 1/min : 1100
Contr.-rod trav.mm: 12.60...12.70
                                                         C-rod trav.mm : 12.60...12.70
                                                       2nd speed 1/min: 600
                                                       C-rod trav.mm : 13.80...14.00
3rd speed 1/min : 865
Del.quantity cm3/: 12.6...12.8
                                                       C-rod trav.mm : 13.40...13.70
4th speed 1/min : 985
               100H.: (12.4...13.0)
Dispersion
              cm3/:0.3
                                                         C-rod trav.mm : 13.00...13.20
               100H.: (C.6)
                                                        compensator (LDA,ADA,ALDA)
2nd speed 1/min: 200.0
Contr.-rod trav. m: 7.3...7.5
Del.quantity cm3/: 0.9...1.5
100H.: (0.6...1.7)
                                                       1st version
                                                       Setting
                                                                    1/min : 500
                                                       Speed
              cm3/:0.3
                                                       Pressure
                                                                    hPa : 700
Dispersion
               100H.: (0.5)
                                                       Contr.-rod trav.mm: 13.80...13.90
SLEEVE POSITION
                                                       Measurement
Control-lever position
                                                       Speed
                                                                    1/min: 500
             Degree: -2
1/min: 600
Speed
                                                       1st pressure hPa : -
Cont.-rod travelmm: 19.20...20.60
                                                         C-rod trav.mm
                                                                           : 11.10...11.20
                                                       2nd pressure hPa : 340
FULL-LOAD DELIV. AT FULL-LOAD STOP
                                                                           : 12.80...12.90
                                                         C-rod trav.mm
                                                       3rd pressure hPa : 250
                                                         C-rod trav.mm
                                                                           : 11.20...11.40
1st version
Speed 1/min: 1100
Charge press. hPa: 700
Del.quantity cm3/: 126.5...128.5
1000H.: (124.5...130.5)
                                                       FUEL-DELIVERY CHARACTERISTICS
                                                       1st version
             cm3/ : 3.00
                                                       Charge press. hPa: 700
Dispersion
             1000H.: (6.00)
                                                                    1/min : 700
                                                       Speed
                                                       Del.quantity cm3/: 135.0...138.0
1000H.: (133.0...140.0)
HIGHEST RATED SPEED
                                                       Charge press. hPa : -
                                                       Speed 1/min: 500
Del.quantity cm3/: 82.5...84.5
Testing:
1st c-rod trav.mm : 11.60
  Speed 1/min: 1145...1160
                                                                    1000H.: (80.5...86.5)
2nd c-rod trav.mm : 4.00
           1/min: 1190...1220
  Speed
                                                       STARTING FUEL DELIVERY
LOWEST RATED SPEED I
Setting point w/out aux. spring
            1/min : 200
                                                       Speed
                                                                    1/min : 100
Contra-rod trav.mm: 6.4
                                                       Del.quantity cm3/: 145.0...155.0
                                                                    1000H.: (142.0...158.0)
                                                       Contr.-rod trav.mm: 17.00...17.40
Testing:
L22
```

Remarks: Check electrically unlatched starting fuel delivery (EES) with 24 volt. Set idle stop at 250 min. -1 to a control-rod travel of 6.5 mm

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                          Contr.-rod trav.mm: 9.00...12.00
                                                          Cam sequence : 1-5- 3- 6- 2- 4
Note inst. in remarks column
                     : FIA 5,9 A
Test sheet
                                                          SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                      : 12.09.86
Edition
Superceeded
Calibrating oil
                     : ISO-4113
                                                          SD mark cyl. no. : 1
Combination no.
                     : 0 400 846 547
                                                          BASIC SETTING
Injection pump
Pump designation : PES6A90D410RS2713
                                                                          1/mi: 1350
                                                          1st speed
EP type number
                     : 0 410 896 083
                                                          Contr.-rod trav.mm: 11:70...11.80
Governor
                     : RQV300...1350AB1175-
Governor design.
                       1L
                                                          Del.quantity cm3/: 6.8...6.9
Governer no.
                     : 0 420 212 183
                                                                          100H.: (6.6...7.1)
Customer-spec. information
Customer
                     : FIAT
                                                          Dispersion
                                                                          cm3/:0.3
                     : 8060.25.661
Engine
                                                                          100H.: (0.5)
                                                          2nd speed 1/min: 300.0
Contr.-rod trav. m: 9.7...9.9
Del.quantity cm3/: 1.2...1.8
100H.: (1.0...2.0)
Dispersion cm3/: 0.2
100H.: (0.4)
1st version kW : 88.0
               1/min: 2700
Speed
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                     : 38...42
                                                          (B) Setting of injection pump with externally-mounted governor
Overflow valve
                     : 1 417 413 000
                                                          SLEEVE TRAVELS
                                                          1st speed 1/min: 300
Inlet press., bar: 1.00
                                                            Sleeve travel mm: 0.90...1.10
                                                          2nd speed 1/min: 435
Sleeve travel mm: 2.40...2.60
3rd speed 1/min: 780
Calibrating nozzle-holder
              : 0 681 343 009
 assembly
                                                            Sleeve travel mm: 4.20...4.40
Opening
 pressure, bar : 172...175
                                                          4th speed 1/min: 1400
                                                            Sleeve travel mm: 8.10...8.20
Test inj. tubing : 1 680 750 014
                                                          SLEEVE POSITION
                                                          Control-lever position
                                                                        Degree: -1
1/min: 1430
Outside diameter
x Wall thickness
                     : 6.00x2.00x600
                                                          Cont.-rod travelmm: 15.20...17.80
x Length mm
                                                          FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
     Insp. values in parentheses
Set constant delivery quant.
                                                          1st version
                                                          Speed 1/min: 1350
Charge press. hPa: 700
    per values ____
                                                          Del.quantity cm3/: 68.0...69.0
1000H: (66.0...71.0)
Dispersion cm3/: 3.00
1000H: (5.00)
START OF DELIVERY
Test pressure, bar: 25...27
                  ; 2.20...2.30
Prestroke mm
                     : (2.15...2.35)
L24
```

HIGHEST RATED SPEED 1st version Control-lever position degrees: 55...63 Testing: 1st c-rod trav.mm: 10.70 Speed 1/min: 1390...1400 2nd c-rod trav.mm: 4.00 1/min : 1515...1545 1/min : 1650 Speed 4th speed C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 14...21 Testing: Speed 1/min: 100 C-rod trav.mm min: 11.20 Speed 1/min: 300 : 9.70...9.90 C-rod trav.mm CONSTANT REGULATION 1/min: 350...450 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 1350 1st speed C-rod trav.mm : 11.70...11.80 2nd speed 1/min: 500 C-rod trav.mm : 11.70...11.90 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 Speed hPa : 700 Pressure Contr.-rod trav.mm: 11.70...11.80 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 11.40...11.50 2nd pressure hPa : 260 C-rod trav.mm : 11.60...11.70 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa: 700 Speed 1/min : 800 Del.quantity cm3/: 57.5...59.5 1000H.: (55.0...62.0) Charge press. hPa : -

1/min : 500

Del.quantity cm3/: 46.5...48.5 1000H.: (44.5...50.5)

STARTING FUEL DELIVERY

Speed 1/min: 100

Del.quantity cm3/: 46.5...48.5 1000H.: (44.5...50.5)

Contr.-rod trav.mm: 18.10...18.50

Remarks:

Test electrically-released starting

quantity (EES) with 12 volts

Speed

```
Contr.-red trav.mm: 9.00...12.00
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Cam sequence : 1-5-3-6-2-4
Note inst. in remarks column
                    : FIA 5.9 A 1
: 12.09.86
Test sheet
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.50 (0.75)
Edition
Superceeded
                    : ISO-4113
Calibrating oil
                                                       SD mark cyl. no. : 1
Combination no.
                    : 0 400 846 550
                                                       BASIC SETTING
Injection pump
Pump designation : PES6A90D410RS2713
                                                                     1/mi: 1350
                                                       1st speed
EP type number
                    : 0 410 896 083
                                                       Contr.-rod trav.mm: 11.70...11.80
Governor
Governor design.
                    : RQV300...1350AB1175-
                                                       Del.quantity cm3/: 6.8...6.9
                      3L
Governer no.
                    : 0 420 212 192
                                                                      100H.: (6.6...7.1)
Customer-spec. information
Customer
                    : FIAT
                                                       Dispersion
                                                                      cm3/:0.3
                                                                      100H.: (0.5)
Engine
                    : 8060.25.640
                                                       2nd speed 1/min: 300.0
Contr.-rod trav. m: 9.7...9.9
1st version kW : 103.0
              1/min: 2700
Speed
                                                       Del.quantity cm3/: 1.2...1.8
                                                                      100H.: (1.0...2.0)
cm3/: 0.2
TEST BENCH REQUIREMENTS
                                                       Dispersion
Calibrating-oil inlet temp. °C
                                                                      100H.: (0.4)
                    : 38...42
                                                        (B) Setting of injection pump with
                                                            externally-mounted governor
Overflow valve
                    : 1 417 413 000
                                                       SLEEVE TRAVELS
                                                       1st speed 1/min: 300
Inlet press., bar : 1.00
                                                         Steeve travel mm: 0.90...1.10
                                                       2nd speed 1/min: 435
Calibrating nozzle-holder
                                                       Steeve travel mm: 2.40...2.60

3rd speed 1/min: 780

Steeve travel mm: 4.20...4.40

4th speed 1/min: 1400

Steeve travel mm: 8.10...8.20
             : 0 681 343 009
 assembly
Opening
 pressure, bar . 172...175
                                                       SLEEVE POSITION
Test inj. tubing : 1 680 750 014
                                                       Control-lever position
                                                                    Degree: -1
1/min: 1430
Outside diameter
x Wall thickness
                                                       Cont.-rod travelmm: 15.20...17.80
                    : 6.00x2.00x600
x Length mm
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
    Insp. values in parentheses
    Set constant delivery quant.
                                                       1st version
    per values ____
                                                       Speed
                                                                      1/min: 1350
                                                       Charge press. hPa : 700
                                                       Del.quantity cm3/: 68.5...69.5
1000H.: (66.5...71.5)
Dispersion cm3/: 3.00
1000H.: (5.00)
START OF DELIVERY
Test pressure, bar: 25...27
Prestroke mm : 2.20...2.30
                    : (2.15...2.35)
```

HIGHEST RATED SPEED 1st version Control-lever position degrees: 55...63 Testing: 1st c-rod trav.mm : 10.70 Speed 1/min: 1390...1400 2nd c-rod trav.mm : 4.00 1/min : 1515...1545 Speed 4th speed 1/min: 1650 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 14...21 Testing: 1/min : 100 Speed G-rod trav.mm min : 11.20 Speed 1/min: 300 : 9.70...9.90 C-rod trav.mm CONSTANT REGULATION 1/min: 350...450 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 1350 1st speed C-rod trav.mm : 11.70...11.80 2nd speed 1/min : 500 C-rod trav.mm : 11.70...11.90 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 11.70...11.80 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 11.20...11.30 2nd pressure hPa : 260 C-rod trav.mm : 11.40...11.50 FUEL-DELIVERY CHARACTERISTICS Charge press, hPa: 700 1/min : 800 Speed Del.quantity cm3/: 59.0...61.0 1000H.: (56.5...63.5) Charge press. hPa: Speed 1/min: 500
Del.quantity cm3/: 44.0...46.0 1000H.: (42.0...48.0)

STARTING FUEL DELIVERY

Speed 1/min: 100
Del.quantity cm3/: 105.0...115.0
1000H:: (102.0...118.0)
Contr.-rod tray.mm: 18.10...18.50

Remarks:

Test electrically-released starting ouantity (EES) with 12 volts

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     Contr.-rod trav.mm: 9.00...12.00
                                                      Cam sequence : 1-5-3-6-2-4
Note inst. in remarks column
Test sheet
                    : FIA 5.9 B
: 13.05.87
                                                     SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Edition
Superceeded
                   : 12.9.86
                 : ISO-4113
Calibrating oil
                                                     SD mark cyl. no. : 1
Combination no.
                    : 0 400 846 551
                                                     BASIC SETTING
Injection pump
Pump designation : PES6A90D410RS2723
                                                                     1/mi: 1500
                                                      1st speed
EP type number
                    : 0 410 896 085
                                                     Contr.-rod trav.mm: 9.00...9.10
Governor
                   : RQV300...1500AB1152-
Governor design.
                                                     Del.quantity cm3/: 4.7...4.8
                   : 0 420 212 195
Governer no.
                                                                    100H.: (4.5...5.0)
Customer-spec. information
                   : IVECO-FIAT
                                                                    cm3/:0.3
Customer
                                                     Dispersion
                                                                    100H.: (0.4)
Engine
                    : 8060,05,661
                                                                    1/min: 300.0
1st version kW : 81.0
                                                     2nd speed
              1/min: 3000
                                                     Contr.-rod trav. m: 8.2...8.4
Speed
                                                     Del.quantity cm3/: 1.0...1.6
100H.: (0.8...1.8)
TEST BENCH REQUIREMENTS
                                                                   cm3/: 0.2
100H.: (0.4)
                                                     Dispersion
Calibrating-oil inlet temp. °C
                    : 38...42
                                                      (B) Setting of injection pump with externally-mounted governor
Overflow valve
                    : 1 417 413 000
                                                     SLEEVE TRAVELS
                                                     1st speed 1/min: 345
Inlet press., bar: 1.00
                                                       Sleeve travel mm: 2.20...2.40
                                                     2nd speed 1/min: 410
Sleeve travel mm: 2.80...3.20
Calibrating nozzle-holder
                  : 0 681 343 009
 assembly
                                                     3rd speed
                                                                  1/min: 630
                                                       Sleeve travel mm: 4.30...4.70
Opening
 pressure, bar : 172...175
                                                     4th speed
                                                                  1/min: 1545
                                                       Steeve travel mm: 8.60...8.70
                                                     5th speed 1/min: 1650
                                                       Sleeve travel mm: 9.30...9.50
Test inj. tubing : 1 680 750 014
                                                     SLEEVE POSITION
Outside diameter
x Wall thickness
                                                     Control-lever position
                                                                  Degree: -1
1/min: 1525
                   : 6.00x2.00x600
x Length mix
                                                     Cont.-rod travelmm: 15.20...17.80
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
    per values
                                                     1st version
                                                     Speed
                                                                   1/min: 1500
JTART OF DELIVERY
                                                     Del.quantity cm3/: 47.5...48.5
1000H.: (45.5...50.5)
Test pressure, bar: 25...27
                                                                  cm3/ : 3.00
Prestroke mm
                   : 2.20...2.30
                                                     Dispersion
                                                                  1000H.: (4.50)
                   : (2.15...2.35)
L28
```

```
HIGHEST RATED SPEED
1st version
Control-lever
 position degrees: 55...63
Testing:
1st c-rod trav.mm : 8.00
  Speed
        1/min : 1540...1550
2nd c-rod trav.mm: 4.00
           1/min : 1635...1665
  Speed
          1/min : 1800
4th speed
  C-rod tray.mm : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 15...23
Testing:
Speed
            1/min : 100
C-rod trav.mm min : 9.00
Speed 1/min : 300
C-rod trav.mm
                  : 8.20...8.40
CONSTANT REGULATION
            1/min : 330...430
Speed
TORQUE CONTROL
Dimension a mm : 1.30
Torque-control curve - 1st version
           1/min : 1500
1st speed
  C-rod trav.mm
                : 9.00...9.10
2nd speed 1/min: 500
                  : 10.30...10.40
  C-rod trav.mm
3rd speed 1/min: 785
  C-rod trav.mm : 9.90...10.10
4th speed 1/min: 1210
  C-rod trav.mm : 9.30...9.50
FUEL-DELIVERY CHARACTERISTICS
           1/min : 500
Speed
Del.quantity cm3/: 43.0...45.0
            1000H.: (40.5...47.5)
STARTING FUEL DELIVERY
            1/min : 100
Speed
Del.quantity cm3/: 95.0...105.0
            1000H.: (92.0...108.0)
Contr.-rod tray.mm: 15.70...16.10
Remarks:
Test electrically-released starting
quantity (EES) with 12 volts
```

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                        SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance ^{+} - ^{+} : 0.50 (0.75)
Note inst. in remarks column
                     : FIA 5.9 A 2
: 15.05.87
Test sheet
Edition
                                                        SD mark cyl. no. : 1
Superceeded
Calibrating oil
                     : ISO-4113
                                                        BASIC SETTING
Combination no.
                     : 0 400 846 557
                                                                        1/mi: 1350
                                                        1st speed
Injection pump
                                                        Contr.-rod trav.mm: 11.50...11.60
Pump designation
                     : PES6A90D410RS2713
                                                        Del.quantity cm3/ : 7.6...7.7
EP type number
                     : 0 410 896 083
Governor
                     : RQV300...1350AB1175-
                                                                       100H.: (7.4...7.9)
Governor design.
                       SL.
                     : 0 420 212 199
                                                        Dispersion
                                                                       cm3/:0.3
Governer no.
                                                                       100H.: (0.5)
Customer-spec. information
Customer
                     : FIAT -
                                                        2nd speed 1/min: 300.0
Contr.-rod trav. m: 8.4...8.6
Del.quantity cm3/: 1.0...1.6
100H.: (0.8...1.8)
                     : 8060.25.630
Engine
TEST BENCH REQUIREMENTS
                                                                       cm3/: 0.2
100H.: (0.4)
                                                        Dispersion
Calibrating-oil inlet temp. OC
                     : 38...42
                                                        (B) Setting of injection pump with
                                                             externally-mounted governor
Overflow valve
                     : 1 417 413 000
                                                        SLEEVE TRAVELS
                                                        1st speed 1/min: 300
Inlet press., bar : 1.00
                                                          Sleeve travel mm: 0.80...0.90
                                                                      1/min: 435
Calibrating nozzle-holder
                                                        2nd speed
                    : 0 681 343 009
                                                          Sleeve travel mm: 2.30...2.70
 assembly
                                                        3rd speed 1/min: 660
                                                          Sleeve travel mm: 3.80...4.20
Opening
                                                        4th speed 1/min: 1395
Sleeve travel mm: 7.70...7.80
 pressure, bar : 172...175
                                                        SLEEVE POSITION
Test inj. tubing : 1 680 750 014
                                                        Control-lever position
                                                                      Degree: -1
1/min: 1470
Outside diameter
x Wall thickness
                                                        Speed
                                                        Cont.-rod travelmm: 15.20...17.80
x Length mm
                     : 6.00x2.00x600
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                        1st version
                                                        Speed
    per values
                                                                       1/min: 1350
                                                        Charge press. hPa: 700
Del.quantity cm3/: 76.5...77.5
1000H.: (74.5...79.5)
START OF DELIVERY
Test pressure, bar: 25...27
                                                                      cm3/ : 3.00
                                                        Dispersion
                                                                      1000H.: (5.00)
Prestroke mm
                     : 2.20...2.30
                    : (2.15...2.35)
Contr.-rod trav.mm: 9.00...12.00
                                                        HIGHEST RATED SPEED
Cam sequence : 1-5- 3- 6- 2- 4
                                                        1st version
```

Control-lever position degrees: 54...62 Testing: 1st c-rod trav.mm : 10.50 Speed 1/min: 1390...1400 2nd c-rod trav.mm: 4.00 1/min : 1520...1550 Speed 4th speed 1/min: 1650 C-rod tray.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 10...18 Testing: 1/min : 100 Speed C-rod trav.mm min: 9.90 Speed 1/min : 300 : 8.40...8.60 C-rod trav.mm CONSTANT REGULATION 1/min : 360...460 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 1350 1st speed C-rod trav.mm : 11.50...11.60 2nd speed 1/min: 500 C-rod trav.mm : 11.50...11.70 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 11.50...11.60 Measurement 1/min : 500 Speed 1st pressure hPa C-rod trav.mm : 10.50...10.60 2nd pressure hPa : 348 C-rod trav.mm : 11.30...11.40 3rd pressure hPa : 330 C-rod trav.mm : 10.90...11.10 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa: 700 Speed 1/min: 800 Del.quantity cm3/: 68.5...70.5 1000H.: (66.0...73.0) Charge press. hPa : -1/min : 500 Speed Del.quantity cm3/: 47.0...49.0 1000H.: (45.0...51.0)

STARTING FUEL DELIVERY

Test electrically-released starting quantity (EES) with 12 volts

M03

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                         : 1-5-3-6-2-4
                                                      Cam sequence
Note inst. in remarks column
                                                      SD ang. spacing ^{0}CS: 0-60-120-180-240-300 Tolerance + - ^{0}: 0.50 (0.75)
                    : MB 6,0 A 4
Test sheet
                    : 03.04.87
Edition
Superceeded
                    : ISO-4113
                                                      BASIC SETTING
Calibrating oil
Combination no.
                    : 0 400 846 563
                                                      1st speed
                                                                     1/mi: 1200
                                                      Contra-rod trav.mm: 11.10...11.20
Injection pump
Pump designation
                    : PES6A90D410RS2667
                                                      Del.quantity cm3/ : 5.8...5.9
EP type number
                    : 0 410 896 080
Governor
                    : RQV300...1200AB1065-
                                                                    100H.: (5.6...6.1)
Governor design.
                      15L
                    : 0 420 212 210
                                                                    cm3/:0.3
Governer no.
                                                      Dispersion
                                                                    100H.: (0.5)
Customer-spec. information
Customer
                    : DAIMLER-BENZ
                                                                    1/min: 300.0
                                                      2nd speed
                    : OM 366
Engine
                                                      Contr.-rod trav. m: 8.9...9.1
                                                      Del.quantity cm3/: 0.9...1.3
100H.: (0.7...1.5)
1st version kW
                    : 92.0
                                                                    cm3/:0.2
                                                      Dispersion
                                                                    100H.: (0.4)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                       (B) Setting of injection pump with
                    : 38...42
                                                          externally-mounted governor
                                                      SLEEVE TRAVELS
Overflow valve
                    : 1 417 413 000
                                                                   1/min: 300
                                                      1st speed
                                                        Sleeve travel mm: 0.80...1.30
                                                      2nd speed 1/min: 500
Inlet press., bar : 1.00
                                                        Sleeve travel mm: 2.30...2.80 d speed 1/min: 750
                                                      3rd speed
Calibrating nozzle-holder
                   : 0 681 343 009
                                                        Sleeve travel mm: 4.30...4.70
 assembly
                                                                   1/min: 1260
                                                      4th speed
                                                        Sleeve travel mm: 8.40...8.60
Opening
pressure, bar
                   : 172...175
                                                      SLEEVE POSITION
                                                      Control-lever position
                                                      Degree: -1
Speed 1/min: 1260
Cont.-rod travelmm: 15.20...17.80
Test inj. tubing : 1 680 750 015
Outside diameter
x Wall thickness
                   : 6.00x1.50x600
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
x Length mm
(A) Injection pump setting values
                                                      1st version
    Insp. values in parentheses
Set constant delivery quant.
                                                      Speed
                                                                    1/min: 1200
                                                      Del.quantity cm3/: 58.0...59.0
1000H: (56.0...61.0)
Dispersion cm3/: 3.00
    per values ____
                                                                   1000H.: (5.00)
START OF DELIVERY
Test pressure, bar: 25...27
                                                      HIGHEST RATED SPEED
Prestroke mm
                    : 2.25...2.35
                                                      1st version
                    : (2.20...2.40)
                                                      Control-lever
Sontrariod trav.mm: 9.00...12.00
                                                       position degrees: 56...64
M04
```

```
Testing:
1st c-rod trav.mm : 10.10
  Speed 1/min: 1240...1250
2nd c-rod trav.mm : 4.00
           1/min : 1330...1360
  Speed
4th speed 1/min: 1500
  C-rod trav.mm : 0.00...1.00
LOWEST RATED SPEED I
Control-lever
 position degrees: 16...24
Testing:
            1/min : 100
Speed
C-rod trav.mm min: 10.30
           1/min : 300
C-rod trav.mm
                   : 8.90...9.10
CONSTANT REGULATION
            1/min: 540...680
Speed
TORQUE CONTROL
Torque-control curve - 1st version
1st speed
            1/min : 1200
  C-rod trav.mm : 11.10...11.20
2nd speed
            1/min : 600
  C-rod trav.mm : 12.30...12.40
3rd speed 1/min : 900
  C-rod trav.mm : 11.80...12.00
4th speed 1/min: 1000
  C-rod trav.mm : 11.30...11.60
SWITCH-OVER POINT
            1/min : 220 (240)
Speed
FUEL-DELIVERY CHARACTERISTICS
Speed 1/min : 600
Del.quantity cm3/: 54.0...56.0
1000H.: (51.5...58.5)
            1/min: 900
Speed
Del.quantity cm3/: 56.0...59.0
            1000H.: (53.5...61.5)
STARTING FUEL DELIVERY
Speed 1/min: 100
Del.quantity cm3/: 78.0...88.0
            1000H.: (75.0...91.0)
Contr.-rod trav.mm: 17.00...17.40
Remarks:
Set shutoff stop to contact at
3.0...3.5 mm control-rod travel.
```

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : KHD 4,1 D : 13.05.87 : 1.86 Calibrating oil : ISO-4113

Combination no. : 0 400 864 063

Injection pump

Pump designation : PES4A85D410/3RS2638

EP type number : 0 410 884 950

Governor

Governor design. : RSV325...1400A8C707-

3L

Governer no. : 0 420 232 440

Customer-spec. information Customer

: BF4L913 Engine

1st version kW : 78.0 1/min: 2800 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC

: 38 . . . 42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Calibrating nozzle-holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values _____

START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60

: (2.45...2.65)

Contrrod trav.mm: 9.0012.00 Cam sequence : 1- 3- 4- 2	<pre>1 4th speed 1/min : 1540 1</pre>
	. I LOWEST RATED SPEED I Control-lever
SD ang. spacing CS: 0-90-180-270 Tolerance + - : 0.50 (0.75)	<pre>l position degrees: 917 l Secting point w/out aux. spring</pre>
BASIC SETTING	I Speed 1/min: 325 i Contrrod trav.mm: 8.0 I Speed 1/min: 325
1st speed	C-rod trav.mm : 8.408.60 C-rod trav.mm : 2.00
Contrrod trav.mm: 12.7012.80	Speed 1/min: 620680
Del.quantity cm3/: 8.28.3	TORQUE CONTROL Torque-control curve - 1st version
100H.: (8.08.5)	l 1st speed 1/min · 125N
Dispersion cm3/: 0.3	C-rod trav.mm : 12.7012.80 C-rod trav.mm : 13.7013.80 C-rod trav.mm : 13.7013.80
100H.: (0.4)	I 3rd speed 1/min: 850 I C-rod trav.mm: 13.5013.60
2nd speed 1/min: 325.0	<pre>1 4th speed 1/min : 950</pre>
Contrrod trav. m: 8.48.6 Del.quantity cm3/: 0.81.4	C-rod trav.mm : 13.2013.40
100H.: (0.61.6) Dispersion cm3/: 0.2	compensator (LDA,ADA,ALDA)
100H.: (0.4)	l 1st version
SLEEVE POSITION	l Setting I Speed 1/min : 500 I Pressure hPa : 700
Control-lever position	I Speed I/min: 500
Degree: -3 Speed 1/min: 800	Contrrod trav.mm: 13.7013.80
Controd travelmm: 0.300.70	1
	l Measurement
Governor-spring reload	l Speed 1/min: 500
Notch setting x : 4,00	10+ 00000
FULL-LOAD DELIV. AT FULL-LOAD STOP	<pre>1 1st pressure hPa : - 1 C-rod trav.mm : 12.3012.40</pre>
TOLL LAND DELIVE AT TOLL LAND OTHER	l 2nd pressure hPa : 390
1st version	l C-rod trav.mm : 13.5013.60
Speed 1/min: 1250	i 3rd pressure hPa : 250
Charge press. hPa : 700	C-rod trav.mm : 12.8013.00
Del.quantity cm3/: 82.583.5 1000H.: (80.585.5)	FUEL-DELIVÈRY CHARACTERISTICS
Dispersion cm3/ : 3.00	Charge press. hPa : 700
1000H.: (4.50)	l Speed 1/min: 850
HICHEST BATEN COCEN	Del.quantity cm3/: 84.586.5 1 1000H.: (82.089.0)
HIGHEST RATED SPEED 1st version	Charge press. hPa : -
Control-lever	Speed 1/min: 500
position degrees: 4957	Del.quantity cm3/: 59.561.5 1 1000H.: (57.563.5)
Testing:	
1st c-rod trav.mm : 11.70	CTARTING CUEL NELTHERY
Speed 1/min: 12901300 2nd c-rod trav.mm: 4.00	STARTING FUEL DELIVERY
Speed 1/min: 13151345	
3rd c-rod trav.mm : 4.00	I Speed 1/min: 100
Speed 1/min: 13601390	· ·
MO7	

Del.quantity cm3/: 95.0...105.0 1000H.: (92.0...108.0) Contr.-rod trav.mm: 17.10...17.30

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Note inst. in remarks column Test sheet : KHD 6,1 A 5 : 13.05.87 Edition BASIC SETTING Superceeded Calibrating oil : ISO-4113 1/mi: 1400 1st speed Combination no. : 0 400 866 080 Contr.-rod trav.mm: 10.80...10.90 Injection pump Del.quantity cm3/: 7.6...7.7 Pump designation : PES6A85D410/3RS2415 EP type number : 0 410 886 915 100H.: (7.4...7.9) Governor Governor design. : RSV325...1400A8C707cm3/:0.3Dispersion 4L : 0 420 232 461 100H.: (0.4) Governer no. Customer-spec. information 1/min: 325.0 2nd speed Contr.-rod trav. m: 7.9...8.1
Del.quantity cm3/: 0.9...1.5
100H.: (0.7...1.7)
Dispersion cm3/: 0.2
100H.: (0.4) Customer : KHD : BF6L913 Engine TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC SLEEVE POSITION : 38...42 Control-lever position Degree: -3 17min: 800 Overflow valve Speed : 1 417 413 000 Cont.-rod travelmm: 0.30...0.70 Governor-spring reload Inlet press., bar : 1.00 Notch setting x : 5.25 Calibrating nozzle-holder FULL-LOAD DELIV. AT FULL-LOAD STOP : 0 681 343 009 assembly Opening 1st version Speed 1/min: 1400 Charge press. hPa: 700 Del.quantity cm3/: 76.0...77.0 1000H.: (74.0...79.0) Dispersion cm3/: 3.00 pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 1000H.: (4.50) Outside diameter x Wall thickness HIGHEST RATED SPEED x Length mm : 6.00x2.00x600 1st version (A) Injection pump setting values Control-lever Insp. values in parentheses Set constant delivery quant. position degrees: 65...73 per values ____ Testing: 1st c-rod trav.mm: 9.80 1/min : 1440...1450 START OF DELIVERY Speed Test pressure, bar: 25...27 2nd c-rod trav.mm : 4.00 Speed 1/min: 1470...1500
3rd c-rod trav.mm: 4.00
Speed 1/min: 1505...1535
4th speed 1/min: 1600 : 1.90...2.00 : (1.85...2.05) Prestroke mm Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2-C-rod trav.mm : 0.30...1.40

M09

LOWEST RATED SPEED I Control-lever position degrees: 14...22 Setting point W/out aux. spring Speed 1/min: 325 Contr.-rod trav.mm: 7.5 Testing: Speed 1/min : 100 C-rod trav.mm min : 19.50 Speed 1/min: 325 C-rod trav.mm: 7.90...8.10 C-rod trav.mm: 2.00 1/min : 600...660 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1400 C-rod trav.mm : 10.80...10.90 2nd speed 1/min: 500 C-rod trav.mm: 12.00...12.10 3rd speed 1/min: 1040 C-rod trav.mm: 11.40...11.60 compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 12.00...12.10 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 10.50...10.60 2nd pressure hPa : 360 C-rod trav.mm : 11.70...11.80 3rd pressure hPa : 95 C-rod trav.mm : 10.60...10.80 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : -Speed 1/min : 50 Speed 1/min: 500 Del.quantity cm3/: 44.0...47.0 1000H.: (42.0...49.0) STARTING FUEL DELIVERY LOW IDLE

M10

1/min : 325 Speed Contr.-rod trav.mm: 7.90...8.10
Del.quantity cm3/: 9.5...15.5
1000H.: (7.5...17.5)
Dispersion cm3/: 2.00

1000H.: (4.06)

Remarks: Test electrically-released starting quantity (EES) with 12 volts

The stop position of the control rod must be easily reached with the stop

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                         SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Note inst. in remarks column
                     : KHD 6,1 A 7
Test sheet
                     : 13.05.87
Edition
                                                         BASIC SETTING
Superceeded
                    : ISO-4113
Calibrating oil
                                                                     1/mi: 1150
                                                         1st speed
                     : 0 400 866 120
                                                         Contr.-rod trav.mm: 11.00...11.10
Combination no.
Injection pump
                                                         Del.quantity cm3/: 6.8...6.9
Pump designation : PES6A85D410/3RS2415
                     : 0 410 886 915
                                                                        100H.: (6.6...7.1)
EP type number
Governor
Governor design.
                     : RSV325...1150A8C673-
                                                         Dispersion
                                                                        cm3/:0.3
                       1L
                     : 0 420 232 489
Governer no.
                                                                        100H.: (0.4)
                                                         2nd speed
                                                                        1/min: 325.0
Customer-spec. information
Customer
                     : KHD
                                                         Contr.-rod trav. m: 8.0...8.2
                                                        Del.quantity cm3/: 0.9...1.5
100H:: (0.7...1.7)
Dispersion cm3/: 0.2
100H:: (0.4)
                     : BF6L913
Engine
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                                                         SLEEVE POSITION
                     : 38...42
                                                         Control-lever position
                                                                      Degree: -3
                                                                        17min: 800
Overflow valve
                                                         Speed
                                                         Cont.-rod travelmm: 0.30...0.70
                     : 1 417 413 000
Inlet press., bar : 1.00
                                                         Governor-spring reload
                                                         Notch setting x : 4.30
Calibrating nozzle-holder
 assembly
                    : 0 681 343 009
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
                                                         1st version
                                                        Speed 1/min: 1150
Del.quantity cm3/: 68.0...69.0
1000H.: (66.0...71.0)
Dispersion cm3/: 3.00
 pressure, bar
                    : 172...175
Test inj. tubing : 1 680 750 014
                                                                       1000H.: (4.50)
Outside diameter
x Wall thickness
                                                        HIGHEST RATED SPEED
                    : 6.00x2.00x600
                                                         1st version
x Length mm
                                                         Control-lever
(A) Injection pump setting values
                                                          position degrees: 49...57
    Insp. values in parentheses
Set constant delivery quant.
                                                         Testing:
    per values ____
                                                         1st c-rod trav.mm : 10.00
                                                           Speed
                                                                     1/min : 1190...1200
                                                         2nd c-rod trav.mm : 4.00
START OF DELIVERY
                                                        Speed 1/min: 1215...1245
3rd c-rod trav.mm: 4.00
Speed 1/min: 1235...1265
4th speed 1/min: 1400
Test pressure, bar: 25...27
                     : 1.90...2.00
Prestroke mm
                     : (1.85...2.05)
Contr.-rod trav.mm: 9.00...12.00
                                                           C-rod trav.mm : 0.30...1.40
                    : 1-5-3-6-2-4
Cam sequence
                                                        LOWEST RATED SPEED I
M11
```

Control-lever position degrees: 13...21 Setting point w/out aux. spring Speed 1/min : 325 Contr.-rod trav.mm: 5.0 Testing: 1/min: 100 Speed C-rod tray.mm min: 19.50 Speed 1/min : 325 C-rod trav.mm : 5.40...5.60 C-rod trav.mm : 2.00 1/min: 505...565 Speed TORQUE CONTROL Torque-control curve - 1st version 1/min : 1150 1st speed C-rod trav.mm : 11.00...11.10 2nd speed 1/min: 500 C-rod trav.mm : 11.70...11.80

STARTING FUEL DELIVERY

4th speed 1/min: 990

C-rod trav.mm : 11.30...11.50

BOSCH INJ. PUMP TEST SPECIFICATIONS Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5-3-6-2-4 Note inst. in remarks column Test sheet : MB 5.7 M 12 : 22.05.87 SD ang. spacing CS: 0-60-120-180-240-300Tolerance + - 0.50 (0.75) Edition Superceeded Calibrating oil : ISO-4113 BASIC SETTING : 0 400 876 108 Combination no. 1/mi: 1400 1st speed Injection pump Contr.-rod trav.mm: 8.50...8.60 Pump designation : PES6A80D410RS2085X EP type number : 0 410 886 045 Del.quantity cm3/: 4.1...4.2 Governor Governor design. : RSV350...1425A2C1001 100H.: (4.0...4.4) : 0 420 232 464 Governer no. Dispersion cm3/:0.2Customer-spec. information Customer 100H.: (0.3) : DAIMLER-BENZ 2nd speed 1/min: 350.0 Contr.-rod trav. m: 7.4...7.6 Del.quantity cm3/: 1.0...1.4 100H.: (0.8...1.5) Dispersion cm3/: 0.2 Engine : 0M352 1st version kW : 66.0 Speed 1/min: 2850 100H.: (0.3) TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C SLEEVE POSITION : 38...42 Control-lever position Degree: -3 1/min: 800 Overflow valve : 1 417 413 000 Cont.-rod travelmm: 0.30...1.00 Governor-spring reload Notch setting x : 4.00 Inlet press., bar : 1.00 Calibrating nozzle-holder : 0 681 343 009 FULL-LOAD DELIV. AT FULL-LOAD STOP assembly Opening 1st version 1/min: 1400 pressure, bar : 172...175 Speed Del.quantity cm3/: 41.5...42.5 1000H.: (40.0...44.0) Dispersion cm3/: 2.00 1000H.: (3.50) Test inj. tubing : 1 680 750 014 Outside diameter HIGHEST RATED SPEED x Wall thickness : 6.00x2.00x600 x Length mm 1st version Control-lever position degrees: 46...54 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Testing: 1st c-rod trav.mm : 7.50 Speed 1/min : 1455...1465 2nd c-rod trav.mm : 4.00 per values ____ START OF DELIVERY Speed 1/min: 1475...1505 3rd c-rod trav.mm: 4.00 Test pressure, bar: 25...27 1/min : 1525...1555 Speed : 2.15...2.25 Prestroke mm 1/min : 1600 : (2.10...2.30) 4th speed M13

C-rod trav.mm : 0.30...1.40 LOWEST RATED SPEED I Setting point w/out aux. spring Speed 1/min: 350 Contr.-rod trav.mm: 7.5 Testing: 1/min : 100 Speed C-rod trav.mm min: 19.50
Speed 1/min: 350
C-rod trav.mm : 7.40...7.60
C-rod trav.mm : 2.00
Speed 1/min: 730...790 TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1400 C-rod trav.mm : 8.50...8.60 2nd speed 1/min: 500 C-rod trav.mm : 9.80...9.90 3rd speed 1/min : 800 C-rod trav.mm : 8.80...9.10 FUEL-DELIVERY CHARACTERISTICS 1/min : 500 Speed Del.quantity cm3/: 40.5...42.5 1000H:: (38.5...44.5) 1/min : 800 Speed Del.quantity cm3/: 39.0...41.0 1000H.: (37.0...43.0) STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 78.0...88.0 1000H.: (75.0...91.0)

```
: 1-5-3-6-2-4
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                     Cam sequence
Note inst. in remarks column
                                                     SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                   : RAB 9,7 D
Test sheet
Edition
                    : 22.05.87
Superceeded
Calibrating oil
                   : ISO-4113
                                                     SD mark cyl. no. : 1
                   : 0 400 876 251
                                                     BASIC SETTING
Combination no.
Injection pump
                                                                    1/mi: 1050
                                                     1st speed
Pump designation
                   : PES6A95D41ORS2108
                                                     Contr.-rod trav.mm: 13.60...13.70
EP type number
                   : 0 410 896 983
Governor
                                                     Del.quantity cm3/: 13.3...13.5
Governor design. : RSV450...1050A1C607L
Governer no.
                   : 0 420 232 381
                                                                   100H.: (13.1...13.7)
Customer-spec. information
                                                                   cm3/:0.3
                                                     Dispersión
Customer
                   : RABA
                                                                   100H.: (0.5)
Engine
                   : D2156 HMT6
1st version kW : 180.0
                                                                   1/min: 450.0
                                                     2nd speed
                                                     Contr.-rod trav. m: 6.2...6.4
              1/min: 2100
Speed
                                                     Del.quantity cm3/: 1.1...1.7
100H.: (0.8...1.9)
TEST BENCH REQUIREMENTS
                                                                   cm3/: 0.3
100H.: (0.5)
                                                     Dispersion
Calibrating-oil inlet temp. °C
                   : 38...42
                                                     SLEEVE POSITION
                                                     Control-lever position
Overflow valve
                                                                  Degree: -3
1/min: 800
                    : 1 417 413 000
                                                     Cont.-rod travelmm: 0.30...0.70
Inlet press., bar : 1.00
                                                     Governor-spring reload
Calibrating nozzle-holder
                   : 0 681 343 009
                                                     Notch setting x : 4.50
 assembly
                                                     FULL-LOAD DELIV. AT FULL-LOAD STOP
Opening
 pressure, bar : 172...175
                                                     1st version
                                                                   1/min: 1050
                                                     Speed
                                                     Del.quantity cm3/: 133.5...135.5
Test inj. tubing : 1 680 750 014
                                                                  1000H.: (131.5...137.5)
cm3/: 3.50
1000H.: (5.50)
Outside diameter
                                                     Dispersion
x Wall thickness
x Length mm
                  : 6.00x2.00x600
                                                     HIGHEST RATED SPEED
(A) Injection pump setting values
                                                     1st version
    Insp. values in parentheses
Set constant delivery quant.
                                                     Control-lever
                                                      position degrees: 50...58
    per values
                                                     Testing:
                                                     1st c-rod trav.mm : 12.60
Speed 1/min : 1090...1100
START OF DELIVERY
Test pressure, bar: 25...27
                                                     2nd c-rod trav.mm: 4.00
                   : 1.70...1.80
                                                                  1/min : 1125...1155
                                                       Speed
Prestroke mm
                   : (1.65...1.85)
                                                     3rd c-rod trav.mm : 4.00
                                                                  1/min: 1160...1190
Contr.-rod trav.mm: 9.00...12.00
                                                       Speed
M15
```

```
4th speed 1/min : 1300
   C-rod trav.mm : 0.30...1.40
LOWEST RATED SPEED I
Control-lever
 position degrees: 22...30
Setting point w/out aux. spring
Speed 1/min : 450
Contra-rod trav.mm: 5.5
Testing:
                1/min : 100
Speed
C-rod trav.mm min: 19.50
Speed 1/min: 450
C-rod trav.mm: 5.90...6.10
C-rod trav.mm: 2.00
Speed 1/min: 560...620
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min: 1050
C-rod trav.mm: 13.60...13.70
2nd speed 1/min: 500
C-rod trav.mm: 13.60...13.80
3rd speed 1/min: 300
   C-rod trav.mm : 14.40...15.00
FUEL-DELIVERY CHARACTERISTICS
Speed
                1/min : 750
Del.quantity cm3/: 131.5...135.5
1000H.: (129.5...137.5)
STARTING FUEL DELIVERY
Speed
                1/min : 100
Del.quantity cm3/: 193.0...203.0
1000H.: (190.0...206.0)
Contr.-rod trav.mm: 19.50...21.00
Remarks:
```

Section .

BOSCH INJ. PUMP TEST SPECIFICATIONS 1/mi: 1100 1st speed Note inst. in remarks column Contr.-rod trav.mm: 11,0...11,1 Del.quantity cm3/ : 7,8...7,9 Test sheet * : KHD 6,1 D1 Edition : 7.86 cm3/:0.30Superceeded Dispersion Calibrating oil : ISO-4113 100H.: (0,45) Combination no. : 0 400 876 270 1/min: 325 2nd speed Contr.-rod trav. m: 6,8...7,0 Injection pump Del.quantity cm3/: 1.0...1,6 Dispersion cm3/: 0.20 100H.: (0,40) Pump designation : PES6A85D410/3RS2537 Governor Governor design. : RSV325...1150A8B2020 SLEEVE POSITION Customer-spec. information Control-lever position Customer Degree: -3 17min: 800 : BF 6 L 913 Cont.-rod travelmm: 0,3...1,0 Engine TEST BENCH REQUIREMENTS Governor-spring reload Notch setting x : -Calibrating-oil inlet temp. C : 38...42 FULL-LOAD DELIV. AT FULL-LOAD STOP Inlet press., bar : 1.0 1st version 1/min: 1150 Speed Charge press. hPa : 650 Calibrating nozzle-holder Del.quantity cm3/: 78,0...79,0 1000H.: (76,0...81,0) : 0 681 343 009 assembly Opening pressure, bar : 172...175 HIGHEST RATED SPEED 1st version Control-lever Test inj. tubing : 1 680 750 014 position degrees: 61...69 Outside diameter Testing: x Wall thickness 1st c-rod trav.mm : 10,0 Speed 1/min: 1190...1200 : 6,00X2,00X600 x Length mm 2nd c-rod trav.mm : 4.0 Speed 1/min : 1225...1255 (A) Injection pump setting values Insp. values in parentheses 4th speed 1/min: 1350 Set constant delivery quant. C-rod trav.mm : 0,3...1,7 per values LOWEST RATED SPEED I START OF DELIVERY Control-lever position degrees: 17...25 : 1,9...2,0 : (1,85...2,05) : 1-5-3-6-2-4 Setting point w/out aux. spring Prestroke mm 1/min : 325 Contr.-rod trav.mm: 5,0 Cam sequence Testing: 1/min : 100 Speed SD ang. spacing $^{\circ}$ CS: 0-60-120-180-240-300 Tolerance + - : 0,5(0,75) C-rod trav.mm min: 19,0 Speed 1/min : 325 C-rod trav.mm : 5,4...5,6 C-rod trav.mm : 2,0 Speed 1/min : 510...570 BASIC SETTING

M17

compensator (LDA, ADA, ALDA)

1st version

Setting

1/min : 500 hPa : 700 Speed Pressure

Contr.-rod trav.mm: 12,6...12,8

Measurement

1/min : 500 Speed

1st pressure hPa : 370 C-rod trav.mm : 12,2...12,3

2nd pressure hPa : 90

: 10,6...10,9 C-rod trav.mm

C-rod trav.mm : 10,6...10,7

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa: 650

1/min : 800 Speed

Del.quantity cm3/: 80.0...82.0 1000H:: (77.5...84.5) Speed 1/min: 500

Del.quantity cm3/: 61,0...63,0

1000H.: (58,5...65,5)

STARTING FUEL DELIVERY

1/min : 100

Del.quantity cm3/: 120,0...130,0

LOW IDLE

1/min : 325 Speed

Del.quantity cm3/: 10,0...16,0

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                      Contr.-rod trav.mm: 9.00...12.00
                                                      Cam seguence : 1-5-3-6-2-4
Note inst. in remarks column
Test sheet
                    : KHD 6,1 D 4
                                                      SP ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
Edition
                    : 15.05.87
Superceeded
                   : ISO-4113
Calibrating oil
                                                      BASIC SETTING
Combination no.
                    : 0 400 876 270
                                                      1st speed
                                                                    1/mi: 1150
Injection pump
                                                      Contr.-rod trav.mm: 11.00...11.10
Pump designation : PES6A85D410RS2537
EP type number
                    : 0 410 886 908
                                                      Del.quantity cm3/: 7.9...8.1
Governor
                    : RSV325...1150A8C2020
Governor design.
                                                                     100H.: (7.7...8.3)
                    : 0 420 232 345
Governer no.
                                                      Dispersion
                                                                     cm3/:0.3
Customer-spec. information
                                                                     100H.: (0.4)
Customer
Engine
                    : BF6L913
                                                      2nd speed
                                                                     1/min: 325.0
                                                      Contr.-rod trav. m: 6.8...7.0
                                                      Del.quantity cm3/: 0.9...1.5
100H.: (0.7...1.7)
Dispersion cm3/: 0.2
1st version kW : 106.6
              1/min: 2300
Speed
                                                                     100H.: (0.4)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                                                      SLEEVE POSITION
                    : 38...42
                                                      Control-lever position
                                                                   Degree: -3
1/min: 800
Overflow valve
                    : 1 417 413 000
                                                      Cont.-rod travelmm: 0.30...0.70
Inlet press., bar : 1.00
                                                      Governor-spring reload
                                                      Notch setting x : 6.00
Calibrating nozzle-holder
           : 0 681 343 009
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
 assembly
Opening
                                                      1st version
 pressure, bar : 172...175
                                                                     1/min: 1150
                                                      Speed
                                                      Charge press. hPa : 500
                                                      Del.quantity cm3/: 79.5...81.5
1000H: (77.5...83.5)
Dispersion cm3/: 3.00
1000H:: (4.50)
Test inj. tubing : 1 680 750 014
Outside diameter
x Wall thickness
                                                      HIGHEST RATED SPEED
x Length mm
                    : 6.00X2.00X600
                                                      1st version
(A) Injection pump setting values
                                                      Control-lever
    Insp. values in parentheses
Set constant delivery quant.
                                                       position degrees: 56...64
    per values ____
                                                      Testing:
                                                      1st c-rod trav.mm : 10.00
Speed 1/min : 1190...1200
START OF DELIVERY
                                                      2nd c-rod trav.mm : 4.00
Test pressure, bar: 25...27
                                                        Speed
                                                                  1/min : 1240...1270
                    : 1.90...2.00
                                                      3rd c-rod trav.mm : 4.00
Prestroke mm
                    : (1.85...2.05)
                                                                  1/min: 1270...1300
                                                        Speed
M19
```

4th speed 1/min: 1435 C-rod trav.mm : 0.30...1.40 LOWEST RATED SPEED I Control-leve: position degrees: 20...28 Setting point w/out aux. spring 1/min : 325 Speed Contr.-rod trav.mm: 6.4 Testing: Speed 1/min : 100 C-rod trav.mm min: 19.50 Speed 1/min: 325 C-rod trav.mm : 6.80...7.00 : 2.00 C-rod trav.mm Speed 1/min : 590...650 TORQUE CONTROL Torque-control curve - 1st version t speed 1/min : 1150 C-rod trav.mm : 11.00...11.10 1st speed 2nd speed 1/min: 960 C-rod trav.mm : 11.70...11.90 3rd speed 1/min: 500 C-rod trav.mm : 12.50...12.60 compensator (LDA_ADA_ALDA) 1st version Setting 1/min : 500 Speed Pressure hPa : 700 Contr.-rod trav.mm: 12.50...12.60 Measurement 1/min : 500 Speed 1st pressure hPa : -: 10.60...10.70 C-rod trav.mm 2nd pressure hPa : 370 C-rod trav.mm : 12.20...12.30 3rd pressure hPa : 90 C-rod trav.mm : 10.60...10.90 FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa: 500 1/min: 850 Del.quantity cm3/: 88.0...91.0 1000H.: (86.0...93.0) Charge press. hPa : -Speed 1/min: 500 Del.quantity cm3/: 60.0...63.0 1000H.: (58.0...65.0)

Speed 1/min: 100

Del.quantity cm3/: 120.0...130.0

1000H.: (117.0...133.0) Contr.-rod trav.mm: 17.40...18.00

Remarks:

APPLICATION
Tractor (tractor engines)

M20

STARTING FUEL DELIVERY

Contr.-rod trav.mm: 9.00...12.00 BOSCH INJ. PUMP TEST SPECIFICATIONS Cam sequence : 1-5-3-6-2-4 Note inst. in remarks column Test sheet : MB 5,7 W 11 : 30.03.87 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Edition Superceeded : 11.84 : ISO-4113 Calibrating oil BASIC SETTING Combination no. : 0 400 876 325 1/mi: 1200 1st speed Injection pump Contr.-rod trav.mm: 9.30...9.40 Pump designation : PES6A90D410RS2569 EP type number : 0 410 896 071 Del.quantity cm3/: 4.3...4.4 Governor : RSV350...1200A0B1140 Governor design. 100H.: (4.1...4.6) -1L : 0 420 232 430 Governer no. Dispersion cm3/:0.3Customer-spec. information Customer : DAIMLER-BENZ 100H.: (0.5) Engine : OM 352 2nd speed 1/min: 350.0 Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/: 1.0...1.6

100H.: (0.7...1.9)

Dispersion cm3/: 0.2

100H.: (0.4) 1st version kW : 70.0 Speed 1/min: 2400 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. C SLEEVE POSITION : 38...42 Control-lever position Degree: -3 17min: 800 Overflow valve Cont.-rod travelmm: 0.30...1.00 : 1 417 413 000 Governor-spring reload Inlet press., bar: 1.00 Notch setting x : 3.75 Calibrating nozzle-holder assembly : 0 681 343 009 FULL-LOAD DELIV. AT FULL-LOAD STOP Opening 1st version Speed 1/min: 1200
Del.quantity cm3/: 43.0...44.0
1000H.: (41.0...46.0)
Dispersion cm3/: 3.00 pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 1000H.: (5,00) Outside diameter x Wall thickness HIGHEST RATED SPEED : 6.00x2.00x600 1st version x Length mm Control-lever (A) Injection pump setting values position degrees: 54...62 Insp. values in parentheses Set constant delivery quant. Testing: per values 1st c-rod trav.mm: 8.30 1/min : 1230...1240 Speed START OF DELIVERY 2nd c-rod trav.mm : 4.00 Speed 1/min: 1255...1285
3rd c-rod trav.mm: 4.00
Speed 1/min: 1325...1355
4th speed 1/min: 1480 Test pressure, bar: 25...27 Prestroke mm : 2.25...2.35 : (2.20...2.40) M21

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C-rod Grav.mm : 0.30...1.70
5th speed 1/min: 1245...1255
  C-rod trav.mm : 8.30
LOWEST RATED SPEED I
Control-lever
 position degrees: -
Testing:
Speed
             1/min : 100
C-rod trav.mm min : 19.50
            1/min : 350
Speed
                : 8.40...8.60
C-rod trav.mm
            mm : 2.00
1/min : 570...630
C-rod trav.mm
Speed
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min : 1200
  C-rod trav.mm : 9.30...9.40
2nd speed 1/min: 850
C-rod trav.mm : 10.60...10.70
3rd speed 1/min : 950
  C-rod trav.mm : 10.30...10.50
4th speed 1/min: 1100
  C-rod trav.mm : 9.50...9.70
FUEL-DELIVERY CHARACTERISTICS
             1/min: 850
Speed
Del.quantity cm3/: 49.0...52.0
1000H.: (46.5...54.5)
STARTING FUEL DELIVERY
             1/min : 100
Speed
Del.quantity cm3/: 78.0...88.0
1000H:: (75.0...91.0)
Contr.-rod trav.mm: 16.10...16.50
Remarks:
APPLICATION
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Unimog

BOSCH INJ. PUMP TEST SPECIFICATIONS Contr.-rod trav.mm: 7.50...10.50 Cam sequence : 1-5-3-6-2-4 Note inst. in remarks column Test sheet : DAF 6,2 0 3 SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) : 13.05.87 Edition Superceeded : 12.9.86 Calibrating oil : ISO-4113 SD mark cyl. no. : 1 Combination no. : 0 400 876 327 START OF DELIVERY DIFFERENCE Injection pump betw.c-rod trav.mm: 8.50...9.50 Difference OCS : 2.50...3.50 : PES6A95D32ORS2693 Pump designation EP type number : 0 410 896 914 Governor Governor design. : RSV300...1300A0C2195 BASIC SETTING : 0 420 233 200 1/mi: 850 Governer no. 1st speed Contr.-rod trav.mm: 11.50...11.60 Customer-spec. information Customer Del.quantity cm3/: 7.6...7.7 : DNT 620 Engine 100H.: (7.4...7.9) 1st version kW : 130.0 Speed 1/min: 2600 Dispersion cm3/:0.3TEST BENCH REQUIREMENTS 100H.: (0.4) 1/min: 300.0 Calibrating-oil inlet temp. OC 2nd speed Contr.-rod trav. m: 6.4...6.6 Del.quantity cm3/: 0.7...1.1 : 38...42 100ff.: (0.4...1.3) cm3/: 0.3 Overflow valve : 1 417 413 000 Dispersion 100H.: (0.5) Inlet press., bar: 1.50 SLEEVE POSITION Calibrating nozzle-holder Control-lever position Degree: -3 1/min: 800 assembly : 0 681 343 009 Cont.-rod travelmm: 0.30...0.70 Opening pressure, bar : 172...175 Governor-spring reload Notch setting x : 6.00 Test inj. tubing : 1 680 750 015 FULL-LOAD DELIV. AT FULL-LOAD STOP Outside diameter x Wall thickness 1st version : 6.00x1.50x600 Speed 1/min: 850 x Length mm Charge press. hPa: 700
Del.quantity cm3/: 76.5...77.5
1000H: (74.5...79.5)
Dispersion cm3/: 3.50 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. 1000H.: (4.50) per values ____ HIGHEST RATED SPEED START OF DELIVERY Test pressure, bar: 25...27 1st version Control-lever Prestroke mm : 2.00...2.10 position degrees: 58...66 : (1.95...2.15)

M23

Testing: 1st c-rod trav.mm: 9.70 Speed 1/min: 1340...1350 2nd c-rod trav.mm: 4.00 Speed i/min: 1400...1430 3rd c-rod trav.mm: 4.00 1/min: 1425...1455 Speed 1/min : 1570 4th speed : 0.30...1.40 C-rod trav.mm LOWEST RATED SPEED I Control-lever position degrees: 27...35 Setting point w/out aux. spring Speed 1/min : 300 Contr.-rod trav.mm: 6.0 1/min : 300 Speed C-rod trav.mm : 6.40...6.60 : 2.00 C-rod trav.mm 1/min: 595...655 Speed TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min : 1290 C-rod trav.mm : 10.70...10.80 2nd speed 1/min : 500 C-rod trav.mm : 11.50...11.60 4th speed 1/min: 1050 C-rod trav.mm : 10.90...11.10 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 600 Speed Pressure hPa : 700 Contr.-rod trav.mm: 11.50...11.60 Measurement 1/min : 600 Speed 1st pressure hPa : -C-rod trav.mm : 11.20...11.40 2nd pressure hPa : 250 : 11.40...11.50 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS Charge press. hPa: 700 1/min : 1290 Del.quantity cm3/ : 72.0...74.0 1000H.: (69.5...76.5) Charge press. ha : -Speed 1/min: 600 Del.quantity cm3/: 65.5...66.5 1000H.: (63.5...68.5) STARTING FUEL DELIVERY

LOW IDLE

Speed 1/min: 300 Contr.-rod trav.mm: 6.40...6.60 Del.quantity cm3/: 7.0...11.0 1000H.: (4.5...13.5) Dispersion cm3/: 3.50 1000H.: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column : MB 6.0 C 2 : 13.05.87 Test sheet Edition Edition Superceeded Calibrating oil : ISO-4113 Combination no. : 0 400 876 335 Injection pump Pump designation : PES6A90D410RS2710 EP type number : 0 410 896 082 Governor : RSV350...1200A1C1154 Governor design. : 0 420 232 468 Governer no. Customer-spec. information Customer : DAIMLER-BENZ : OM 366 Engine 1st version kW : 74.0 Speed 1/min: 2400 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 000 Inlet press., bar: 1.00 Calibrating nozzle-holder assembly : 0 681 343 009 Opening | pressure, bar : 172...175 Test inj. tubing : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values ____ START OF DELIVERY Test pressure, bar: 25...27

: 2.25...2.35 Prestroke mm

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 C-rod trav.mm : 0.30...1.40 5th speed 1/min: 1255...1265 C-rod trav.mm: 8.30 C-rod trav.mm LOWEST RATED SPEED I SD ang. spacing $^{\circ}$ CS: 0-60-120-180-240-300 Tolerance + - $^{\circ}$: 0.50 (0.75) Control-lever position degrees: ? BASIC SETTING Testing: 1/min : 100 Speed C-rod trav.mm min: 19.50 Speed 1/min: 350 1/mi: 1200 1st speed Contr.-rod tray.mm: 9.30...9.40 C-rod trav.mm : 8.20...8.40 C-rod trav.mm : 2.00 Del.quantity cm3/: 4.8...4.9 1/min: 465...525 Speed 100H.: (4.6...5.1) TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min: 1200 Dispersion cm3/:0.3C-rod trav.mm : 9.30...9.40 100H.: (0.4) 2nd speed 1/min: 600 C-rod trav.mm : 10.40...10.60 1/min: 350.0 3rd speed 1/min: 800 2nd speed Contr.-rod trav. m: 8.0...8.6 C-rod trav.mm : 10.30...10.50 Del.quantity cm3/: 1.0...1.2 100H.: (0.8...1.4) 4th speed 1/min : 1000 C-rod trav.mm : 9.40...9.70 cm3/: 0.2 100H.: (0.4) Dispersion FUEL-DELIVERY CHARACTERISTICS Speed 1/min: 600 Del.quantity cm3/: 41.0...43.0 1000H.: (38.5...45.5) SLEEVE POSITION Control-lever position Degree: -3 1/min: 800 1/min: 900 Speed Del.quantity cm3/: 44.0...47.0 1000H.: (41.5...49.5) Cont.-rod travelmm: 0.03...1.00 Governor-spring reload Notch setting x : 5.00 STARTING FUEL DELIVERY FULL-LOAD DELIV. AT FULL-LOAD STOP 1/min : 100 Speed Del.quantity cm3/: 78.0...88.0 1st version 1000H.: (75.0...91.0) Speed 1/min: 1200 Del.quantity cm3/: 48.0...49.0 1000H: (46.0...51.0) Dispersion cm3/: 3.00 1000H: (4.50) Contr.-rod trav.mm: 16.80...17.20 LOW IDLE Speed 1/min: 350 Contr.-rod trav.mm: 8.00...8.60 HIGHEST RATED SPEED Del.quantity cm3/: 10.0...12.0 1000H.: (8.0...14.0) 1st version Control-lever Dispersion cm3/: 2.50 position degrees: 59...67 1000H.: (4.50) Testing: 1st c-rod trav.mm : 8.30 Remarks: Speed 1/min: 1240...1245 **APPLICATION** 2nd c-rod trav.mm : 4.00 Unimog Speed 1/min: 1261...1274 3rd c-rod trav.mm: 4.00 Speed 1/min: 1300...1330 4th speed 1/min: 1400

H26

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6.0 0 Edition : 13.05.87 Superceeded : 12.9.86 : MB 6.0 C 3 : 13.05.87 Calibrating oil : ISO-4113

Combination no. : 0 400 876 336

Injection pump

Pump designation : PES6A90D410RS2710 EP type number : 0 410 896 082

Governor

Governor design. : RSV350...1200A1C1154 -1L

Governer no. : 0 420 232 470

Customer-spec. information : DAIMLER-BENZ

: OM 366 Engine

1st version kW : 81.0 Speed 1/min: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values ____

START OF DELIVERY

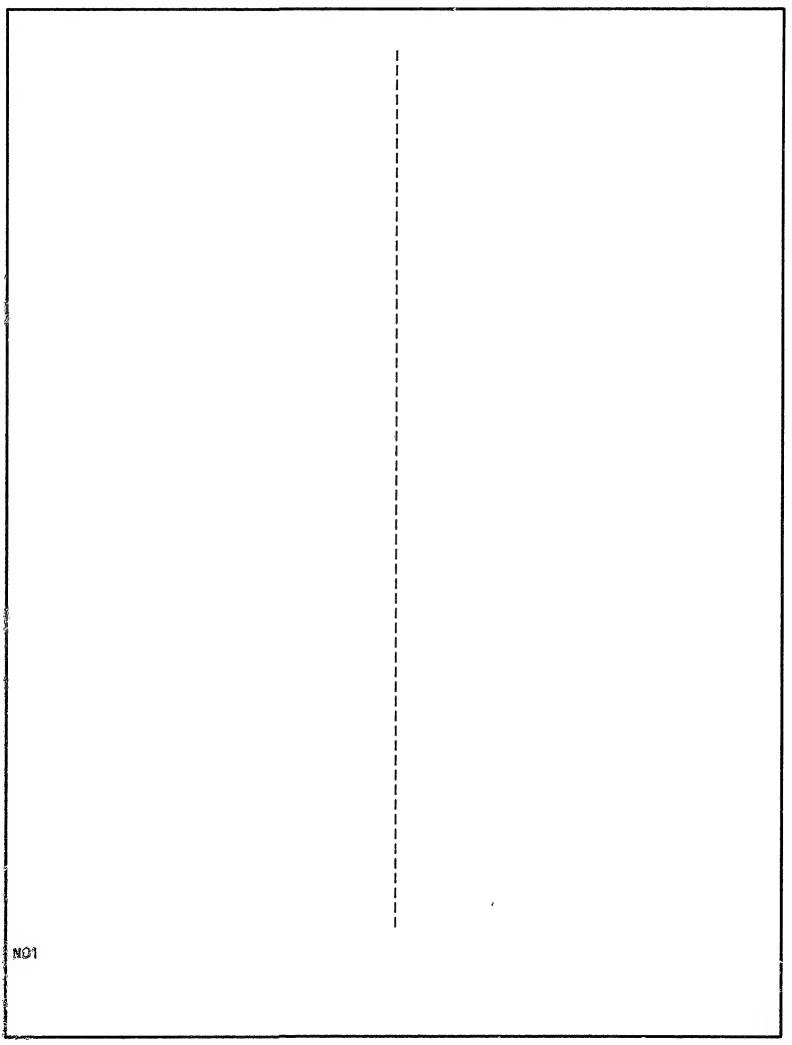
Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35

: (2.20...2.40)

C-rod trav.mm : 0.30...1.40 5th speed 1/min : 1250...1260 C-rod trav.mm : 8.80 Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1- 5- 3- 6- 2- 4 LOWEST RATED SPEED I SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Control-lever position degrees: -3 Setting point w/out aux. spring BASIC SETTING Speed 1/min : 350 Contr.-rod trav.mm: 8.50 1/mi: 1200 1st speed Testing: Speed 1/min: 100 C-rod trav.mm min: 19.50 Speed 1/min: 350 Contr.-rod trav.mm: 9.80...9.90 Del.quantity cm3/: 5.1...5.2 C-rod trav.mm : 8.40...8.60 C-rod trav.mm : 2.00 100H.: (4.9...5.4) Speed 1/min: 520...550 cm3/: 0.3 Dispersion TORQUE CONTROL Torque-control curve - 1st version 1st speed 1/min: 1200 C-rod trav.mm: 9.80...9.90 100H.: (0.4) 2nd speed 1/min: 350.0 Contr.-rod trav. m: 8.4...8.6 2nd speed 1/min: 600 Del.quantity cm3/: 1.0...1.2 C-rod trav.mm : 11.30...11.40 3rd speed 1/min : 850 100H.: (0.8...1.4) cm3/: 0.2 100H.: (0.4) Dispersion C-rod trav.mm : 11.10...11.30 4th speed 1/min: 950 C-rod trav.mm : 10.30...10.60 SLEEVE POSITION FUEL-DELIVERY CHARACTERISTICS Control-lever position Degree: -3 1/min: 800 Speed 1/min: 600 Del.quantity cm3/: 48.0...50.0 Cont.-rod travelmm: 0.30...1.00 1000H.: (45.5...52.5) 1/min : 850 Speed Del.quantity cm3/: 49.0...52.0 1000H.: (46.5...54.5) Governor-spring reload Notch setting x : 5.00 FULL-LOAD DELIV. AT FULL-LOAD STOP STARTING FUEL DELIVERY 1st version 1/min: 1200 Speed Del.quantity cm3/: 51.0...52.0 1000H:: (49.0...54.0) Dispersion cm3/: 3.00 1000H:: (4.50) Speed 1/min : 100 Del.quantity cm3/: 78.0...88.0 1000H.: (75.0...91.0) LOW IDLE HIGHEST RATED SPEED Speed 1/min: 350 Contr.-rod trav.mm: 8.10...8.80 1st version Control-lever Del.quantity cm3/: 10.0...12.0 1000H.: (8.0...14.0) position degrees: 59...67 cm3/: 2.50 1000H.: (84.50) Testing: Dispersion 1st c-rod trav.mm : 8.80 Speed 1/min: 1240...1245 2nd c-rod trav.mm: 4.00 Remarks: Speed 1/min: 1262...1275 3rd c-rod trav.mm: 4.00 APPLICATION Unimog Speed 1/min: 1305...1335 4th speed 1/min: 1400

M28



Note inst. in remarks column Test sheet : MB 5,7 V 19 : 10.04.87 Edition Superceeded Calibrating oil : ISO-4113 : 0 400 876 338 Combination no. Injection pump Pump designation : PES6A90D410RS2596 EP type number : 0 410 896 073 Governor Governor design. : RSV300...1100A0C1148 -2L Governer no. : 0 420 232 477 Customer-spec. information Customer : DAIMLER-BENZ : 0M352 Engine 1st version kW : 92.0 1/min: 2200 Speed TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. OC : 38...42 Overflow valve : 1 417 413 000 Inlet press. bar: 1.00 Calibrating nozzle-holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test inj. tubing : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values ____ START OF DELIVERY Test pressure, bar: 25...27 : 2.00...2.10 Prestroke mm : (1.95...2.15)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 4th speed 1/min: 1350 C-rod tray.mm : 0.30...1.70 LOWEST RATED SPEED I Control-lever SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - 0.50 (0.75) position degrees: -3 Setting point w/out aux. spring Speed 1/min: 300 BASIC SETTING Contr.-rod trav.mm: 8.20 1/mi: 1100 1st speed Testing: 1/min: 100 Speed Contr.-rod trav.mm: 10.90...11.00 C-rod trav.mm min: 19.50 1/min : 300 Speed C-rod trav.mm : 8.10...8.30 C-rod trav.mm : 2.00 Del.quantity cm3/ : 6.3...6.4 1/min: 470...530 100H.: (6.1...6.6) Speed cm3/: 0.3Dispersion TORQUE CONTROL Torque-control curve - 1st version 100H.: (0.5) 1/min : 1100 1st speed C-rod trav.mm : 10.90...11.00 2nd speed 1/min : 750 2nd speed 1/min: 300.0 Contr.-rod trav. m: 8.1...8.3

Del.quantity cm3/: 0.8...1.4

100H.: (0.6...1.6)

Dispersion cm3/: 0.2

100H.: (0.4) C-rod trav.mm : 12.60...12.70 3rd speed 1/min: 1000 C-rod tray.mm : 11.50...11.70 compensator (LDA, ADA, ALDA) SLEEVE POSITION Control-lever position 1st version Degree: -3 Setting 1/min : 750 hPa : 700 17min: 800 Speed Speed Cont.-rod travelmm: 0.30...1.00 Pressure Contr.-rod trav.mm: 12.60...12.70 Governor-spring reload Notch setting x :? Measurement 1/min: 750 Speed FULL-LOAD DELIV. AT FULL-LOAD STOP 1st pressure hPa : -: 11.80...11.90 C-rod trav.mm 1st version Speed 1/min: 1100 Charge press. hPa: 700 Del.quantity cm3/: 63.5...64.5 1000H.: (61.5...66.5) Dispersion cm3/: 3.00 1000H.: (5.00) 2nd pressure hPa : 400 : 12.20...12.30 C-rod tray mm FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa: 700 Speed 1/min : 750 HIGHEST RATED SPEED Del.quantity cm3/: 72.5...74.5 1000H.: (70.0...77.0) 1st version Control-lever Charge press. hPa : position degrees: 44...52 1/min : -Speed Del.quantity cm3/: 67.0...69.0 Testing: 1000H.: (64.5...71.5) 1st c-rod trav.mm : 9.90 Charge press. hPa : -Speed 1/min: 1140...1150 1/min : 500 2nd c-rod trav.mm : 4.00 Speed Speed 1/min: 1190...1220 3rd c-rod trav.mm: 4.00 Del.quantity cm3/: 58.0...60.0 1000H:: (56.0...62.0) 1/min : 1220...1250 Speed

STARTING FUEL DELIVERY

Remarks: Hydraulic latching of starting delivery.

Latching at 0.4 bar ... 0.5 bar.

Unlatching at 0.15 bar...0.25 bar.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                       Contr.-rod trav.mm: 9.00...12.00
                                                       Cam sequence : 1-5- 3- 6- 2- 4
Note inst. in remarks column
Test sheet
                    : KHD 1 0 1
                                                       SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                    : 22.05.87
Edition
Superceeded
Calibrating oil
                    : ISO-4113
                                                       BASIC SETTING
Combination no.
                    : 0 400 876 344
                                                       1st speed
                                                                       1/mi: 1250
Injection pump
                                                       Contr.-rod trav.mm: 11.60...11.70
Pump designation
                    : PES6A95D410RS2625
EP type number
                    : 0 410 896 926
                                                       Del.quantity cm3/: 9.3...9.5
Governor
Governor design.
                    : RSV325...1250A2C1159
                                                                      100H.: (9.1...9.7)
                    : 0 420 232 490
Governer no.
                                                       Dispersion
                                                                     cm3/:0.3
Customer-spec. information
                                                                      100H.: (0.6)
Customer
Engine
                    : BF6L913C
                                                       2nd speed
                                                                      1/min: 350.0
                                                       Contr.-rod trav. m: 6.4...6.6
                                                       Del.quantity cm3/: 1.0...1.6
100H:: (0.7...1.8)
Dispersion cm3/: 0.3
100H:: (0.5)
1st version kW : 130.0
              1/min: 2500
Speed
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                       SLEEVE POSITION
                    : 38...42
                                                       Control-lever position
                                                                    Degree: -3
1/min: 800
Overflow valve
                                                       Cont.-rod travelmm: 0.30...0.70
                    : 1 417 413 000
                                                       Governor-spring reload
Inlet press., bar : 1.00
                                                       Notch setting x : 4.25
Calibrating nozzle-holder
             : 0 681 343 009
                                                       FULL-LOAD DELIV. AT FULL-LOAD STOP
 assembly
Opening
                                                       1st version
 pressure, bar : 172...175
                                                       Speed
                                                                     1/min: 1250
                                                       Charge press. hPa : 900
                                                       Del.quantity cm3/: 93.0...95.0
1000H:: (91.0...97.0)
Dispersion cm3/: 3.50
1000H:: (6.00)
Test inj. tubing : 1 680 750 014
Outside diameter
x Wall thickness
                                                       HIGHEST RATED SPEED
x Length mm
                    : 6.00x2.00x600
                                                       1st version
(A) Injection pump setting values
                                                       Control-lever
    Insp. values in parentheses
Set constant delivery quant.
                                                        position degrees: 47...55
    per values ____
                                                       Testing:
                                                       1st c-rod trav.mm : 10.60
Speed 1/min : 1290...1300
START OF DELIVERY
                                                       2nd c-rod trav.mm: 4.00
Test pressure, bar: 25...27
                                                         Speed
                                                                   1/min : 1345...1375
                                                       3rd c-rod trav.mm: 4.00
                  : 1.90...2.00
Prestroke mm
                    : (1.85...2.05)
                                                                   1/min : 1355...1385
                                                         Speed
N<sub>0</sub>5
```

4th speed 1/min: 1520 C-rod trav.mm : 0.30...1.40 LOWEST RATED SPEED I Control-lever position degrees: 17...25 Setting point w/out aux. spring 1/min : 350 Contr.-rod trav.mm: 5.0 Testing: 1/min : 100 Speed C-rod tray.mm min : 19.50 Speed 1/min : 350 C-rod trav.mm : 5.40...5.60 C-rod trav.mm : 2.00 1/min : 520...580 Speed TORQUE CONTROL Dimension a mm : 0.40 Torque-control curve - 1st version 1st speed 1/min : 1250 C-rod trav.mm : 11.60...11.70 2nd speed 1/min: 500 C-rod trav.mm : 12.00...12.10 4th speed 1/min: 1105 C-rod trav.mm : 11.70...11.90 compensator (LDA, ADA, ALDA) 1st version Setting 1/min: 500 Speed hPa : 900 Pressure Contr.-rod trav.mm: 12.00...12.10 Measurement Speed 1/min: 500 1st pressure hPa : -C-rod trav.mm : 10.30...10.40 2nd pressure hPa : 540 C-rod trav.mm : 11.50...11.60 3rd pressure hPa : 420 C-rod trav.mm : 10.80...11.00 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : 900 1/min : 1000 Speed Del.quantity cm3/: 94.5...97.5 1000H.: (92.0...100.0) Charge press. hPa: 900 Speed 1/min: 1150 Del.quantity cm3/: 93.0...96.0 1000H.: (90.5...98.5)

Del.quantity cm3/: 54.0...56.0 1000H.: (52.0...58.0)

STARTING FUEL DELIVERY

1/min : 100 Speed

Del.quantity cm3/: 120.0...130.0 1000H.: (117.0...133.0) Contr.-rod trav.mm: 16.30...16.70

APPLICATION

Combine-harvester

N06

Speed

Charge press. hPa : -

1/min : 500

```
: 1-5-3-6-2-4
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                        Cam sequence
Note inst. in remarks column
Test sheet
                                                        SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
                     : RAB 10,8 A
                    : 30.03.87
: 5.84
: ISO-4113
Edition
Superceeded
Calibrating oil
                                                        SD mark cyl. no. : 1
                     : 0 401 276 051
                                                        BASIC SETTING
Combination no.
                                                                        1/mi: 950
Injection pump
                                                        1st speed
Pump designation : PES6A100D410RS3039
                                                        Contr.-rod trav.mm: 13.60...13.70
EP type number
                     : 0 411 206 018
Governor
Governor design. : RSV475...950A1C2121L
Governer no. : 0 420 232 384
                                                        Del.quantity cm3/: 15.2...15.4
                                                                       100H.: (15.0...15.6)
Customer-spec. information
Customer
                     : RABA
                                                        Dispersion
                                                                       cm3/:0.3
Engine
                     : D2156 MKTL6
                                                                       190H.: (0.6)
1st version kW
                   : 184.0
                                                        2nd speed
                                                                       1/min: 475.0
                                                        Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/: 1.1...1.5

100H.: (0.9...1.8)

Dispersion cm3/: 0.3

100H.: (0.5)
Speed
               1/min: 1900
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                     : 38...42
                                                        SLEEVE POSITION
Overflow valve
                                                        Control-lever position
                     : 1 417 413 000
                                                                      Degree: -3
                                                                       17min: 800
                                                        Speed
                                                        Cont.-rod travelmm: 0.30.. 🚜
Inlet press., bar : 1.00
Calibrating nozzle-holder
                                                        Governor-spring reload
 assembly
                    : 0 681 343 009
                                                        Notch setting x : 3.75
Opening
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
 pressure, bar : 172...175
                                                        1st version
                                                        Speed
                                                                       1/min: 950
                                                        Charge press. hPa: 750
Del.quantity cm3/: 152.0...154.0
1000H.: (150.0...156.0)
Dispersion cm3/: 3.00
Test inj. tubing : 1 680 750 014
Outside diameter
x Wall thickness
                                                                      1000H.: (6.00)
                    : 6.00x2.00x600
x Length mm
                                                        HIGHEST RATED SPEED
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                        1st version
                                                        Control-lever
    per values ____
                                                         position degrees: 45...53
                                                        Testing:
START OF DELIVERY
                                                        1st c-rod trav.mm : 12.60
Test pressure, bar: 25...27
                                                                     1/min : 990...1000
                                                          Speed
Prestroke mm
                     : 1.60...1.70
                                                        2nd c-rod trav.mm: 4.00
                                                                      1/min: 1025...1055
                     : (1.55...1.75)
                                                          Speed
Contr.-rod trav.mm: 9.00...12.00
                                                        3rd c-rod trav.mm: 4.00
NO7
```

1/min : 1030...1060 1/min : 1195 Speed 4th speed C-rod trav.mm : 0.30...1.40 LOWEST RATED SPEED I Control-lever position degrees: 23...31 Setting point w/out aux. spring 1/min : 475 Speed ' Contr.-rod trav.mm: 5.5 Testing: Speed 1/min : 100 C-rod trav.mm min : 19.50 Speed 1/min : 475 : 5.90...6.10 C-rod trav.mm : 2.00 C-rod trav.mm 1/min : 570...630 Speed 1/min : 675 Speed C-rod trav.mm max : 1.00 TORQUE CONTROL Torque-control curve - 1st version 1/min : 950 1st speed C-rod trav.mm : 13.60...13.70 1/min : 500 2nd speed C-rod trav.mm : 15.70...15.80 3rd speed 1/min: 840 C-rod trav.mm : 14.90...15.10 compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 Speed hPa : 750 Pressure Contr.-rod trav.mm: 15.70...15.80 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 13.40...13.50 2nd pressure hPa : 550 C-rod trav.mm : 15.00...15.10 3rd pressure hPa : 420 C-rod trav.mm : 14.10...14.30 FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa: 750 Speed 1/min: 750
Del.quantity cm3/: 180.0...184.0
1000H.: (178.0...186.0) Charge press. hPa : -Speed 1/min : 500 Del.quantity cm3/: 0.0...149.0 1000H.: (0.0...151.0)

BON

Remarks: APPLICATION Tractor (tractor engines)

SD ang. spacing $^{\circ}$ CS: 0-60-120-180-240-300 Tolerance + - $^{\circ}$: 0.5(0.75) BOSCH INJ. PUMP TEST SPECIFICATIONS Note inst. in remarks column SD mark cyl. no. : 1 Test sheet : VOL 7,1 A 4 Edition : 6.87 BASIC SETTING : 11.86 Superceeded : ISO-4113 1/mi: 700 Calibrating oil 1st speed Combination no. : 0 401 846 505 E Contr.-rod trav.mm: 11.20...11.30 Injection pump Del.quantity cm3/: 10.1...10.3 Pump designation : PE6P110A320RS483E EP type number 100H.: (9.8...10.6) : 0 411 816 159 Governor Governor design. : RQV250...1100PA499-1 cm3/:0.4Dispersion 100H.: (0.75) Customer-spec. information Customer : VOLVO 2nd speed 1/min: 250 Centr.-rod trav. m: 5.30...5.50 Del.quantity cm3/: 1.6...2.0 100H.: (-) Engine : TD 71 TEST BENCH REQUIREMENTS cm3/:0.3Dispersion Calibrating-oil inlet temp. °C 100H.: (0.6) : 38...42 SLEEVE POSITION Control-lever position Overflow valve Degree: -1 1/min: 1200 : 1 417 413 025 Speed Cont.-rod travelmm: 15.20...17.80 Inlet press., bar : 1.50 FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating nozzle-holder : 0 681 343 009 assembly 1st version Opening 1/min: 700 Speed Charge press. hPa : 900 Del.quantity cm3/ : 101.0...103.0 1000H.: (98.0...106.0) pressure, bar : 172...175 : 1 680 750 015 cm3/ : 4.0Test inj. tubing Dispersion 1000H.: (7.5) Outside diameter x Wall thickness HIGHEST RATED SPEED x Length mm : 6,00x1,50x600 1st version Control-lever position degrees: 54...62 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. Testing: per values 1st c-rod trav.mm : 10.20 1/min : 1160...1170 Speed 2nd c-rod trav.mm: 4.00 START OF DELIVERY 1/min : 1260...1290 Test pressure, bar: 25...27 Speed 1/min : 1400 4th speed : 3.00...3.10 : (2.95...3.15) : 0.00...1.00 C-rod trav.mm Prestroke mm Contr.-rod trav.mm: 9.00...12.00 LOWEST RATED SPEED I Cam sequence : 1-5-3-6-2-4 Control-lever position degrees: 5...13 Testing:

N09

```
Speed
              1/min : 100
C-rod trav.mm min: 6.80
             1/min : 250
mm : 5.30...5.50
Speed
C-rod trav.mm
CONSTANT REGULATION
              1/min: 300...410
Speed
 compensator (LDA,ADA,ALDA)
1st version
Setting
            1/min : 500
hPa : 900
Speed
Pressure
Contr.-rod trav.mm: 11.20...11.30
Measurement
              1/min : 500
Speed
1st pressure hPa : -
                     : 8.70...8.90
  C-rod trav.mm
2nd pressure hPa : 560
C-rod trav.mm : 11.0...11.1
3rd pressure hPa : 290
                    : 9.1...9.3
  C-rod trav.mm
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 900
Speed 1/min: 1000
Del.quantity cm3/: 110.0...114.0
              1000H.: (107.0...117.0)
Charge press. hPa : -
              1/min: 700
Speed
Del.quantity cm3/: 68.0...70.0
1000H.: (65.0...73.0)
STARTING FUEL DELIVERY
Speed
              1/min : 100
Del.quantity cm3/: 170.0...200.0
1000H.: (-)
Contr.-rod trav.mm: 20.00...21.00
LOW IDLE
              1/min : 250
Speed
Contr.-rod trav.mm: 5.30...5.50
Del.quantity cm3/: 16.0...20.0
              1000H.: (-)
              cm3/: 3.0
1000H.: (6.0)
Dispersion
Remarks:
Delivery-valve spring pre-tension =
2.40...2.60 mm.
N10
```

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet Edition Superceeded : VOL 14 0 S : 12.06.87

Superceeded : - Calibrating oil : ISO-4113

Combination no. : 0 401 846 529

Injection pump

Pump designation : PE6P12OA32ORS3186 EP type number : 0 411 826 756

Governor

Governor design. : RQV250..1025PA657-13 Governer no. : 0 421 813 592

Customer-spec. information Customer : **VOLVO**

: TD102F Engine

1st version kW : 220.0 1/min: 2050 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. OC : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Perforated-plate

: 0,8 diameter mm

Test inj. tubing : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. per values ____

START OF DELIVERY

,t....

Test pressure, bar: 25...27

Del.quantity cm3/: 197.0...199.0 Prestroke mm : 2.60...2.70 : (2.55...2.75) 1000H.: (194.0...202.0) cm3/ : 5.00Contr.-rod trav.mm: 9.00...12.00 Dispersion Cam sequence : 1-5-3-6-2-4 1000H.: (9.00) HIGHEST RATED SPEED 1st version SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Control-lever position degrees: 58...66 SD mark cyl. no. : 1 Testing: 1st c-rod trav.mm: 10.40 BASIC SETTING Speed 1/min: 1055...1065 2nd c-rod trav.mm : 4.00 Speed 1/min : 1110...1140 4th speed 1/min : 1250 C-rod trav.mm : 0.00...1.00 1st speed 1/mi: 700 Contr.-rod trav.mm: 11.40...11.50 Del.quantity cm3/ : 19.7...19.9 LOWEST RATED SPEED I Control-lever 100H.: (19.4...20.2) position degrees: 4..12 Dispersion cm3/:0.5Testing: Speed 1/min: 100 C-rod trav.mm min: 5.40 Speed 1/min: 250 100H.: (0.9) 2nd speed 1/min: 250.0 Contr.-rod trav. m: 3.9...4.1 Del.quantity cm3/: 1.7...2.2 100H.: (1.4...2.4) Dispersion cm3/: 0.5 100H.: (0.7) C-rod trav.mm : 3.90...4.10 CONSTANT REGULATION 1/min : 250...350 Speed compensator (LDA, ADA, ALDA) (B) Setting of injection pump with externally-mounted governor 1st version Setting 1/min : 500 SLEEVE TRAVELS Speed hPa : 1000 1st speed 1/min: 250 Pressure Sleeve travel mm: 1.20...1.30
2nd speed 1/min: 430
Sleeve travel mm: 3.50...3.80
3rd speed 1/min: 700 Contr.-rod trav.mm: 11.40...11.50 Measurement 1/min : 500 Speed Sleeve travel mm: 6.40...6.60 4th speed 1/min: 900 1st pressure hPa : -: 8.90...9.10 Sleeve travel mm: 6.40...6.60 C-rod trav.mm Sth speed 1/min: 1080 Sleeve travel mm: 8.30...8.50 2nd pressure hPa : 770 C-rod trav.mm : 11.20...11.30 3rd pressure hPa : 420 : 9.40...9.60 SLEEVE POSITION C-rod trav.mm Control-lever position FUEL-DELIVERY CHARACTERISTICS Degree: -1 Charge press. hPa : -Speed 1/min : 700 17min: 1080 Cont.-rod travelmm: 15.20...17.80 Del.quantity cm3/: 149.0...151.0 1000H.: (146.0...154.0) FULL-LOAD DELIV. AT FULL-LOAD STOP LOW IDLE 1st version Speed 1/min: 700 Charge press. hPa : 1000 1/min : 250 Speed Contr.-rod trav.mm: 3.90...4.40

Del.quantity cm3/: 17.0...22.0 1000H.: (14.5...24.5) Dispersion cm3/: 5.00 1000H.: (7.00)

Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                        SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75)
Test sheet
                    : DAF 11.6 X2
: 10.04.87
Edition
Superceeded
                                                        BASIC SETTING
Calibrating oil : ISO-4113
                                                                        1/mi: 600
                                                        1st speed
                    : 0 401 846 540
Combination no.
                                                        Contr.-rod trav.mm: 12.80...12.90
Injection pump
Pump designation : PE6P110A320RS407-1
                                                        Del.quantity cm3/: 15.3...15.5
EP type number : 0 411 816 147
                                                                       100H.: (15.0...15.7)
Governor
Governor design.
                    : RQ275/1000PA861
Governer no.
                    : 0 421 801 397
                                                        Dispersion
                                                                       cm3/:0.4
Customer-spec. information
                                                                       100H.: (0.7)
Customer
                    : DAF
                                                        2nd speed 1/min: 275.0
Contr.-rod trav. m: 7.2...7.4
Del.quantity cm3/: 1.4...1.9
100H.: (1.1...2.1)
Engine
                    : LT 195
1st version kW
                   : 195.0
                                                                       cm3/:0.4
                                                        Dispersion
                                                                       100H.: (0.7)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. °C
                                                        SLEEVE POSITION
                    : 38...42
                                                        Control-lever position
                                                                      Degree: -1
1/min: 600
Overflow valve
                     : 1 417 413 025
                                                        Cont.-rod travelmm: 15.40...16.60
Inlet press., bar: 1.50
                                                        FULL-LOAD DELIV. AT FULL-LOAD STOP
Calibrating nozzl@-holder
                                                        1st version
               : 0 681 343 009
                                                                       1/min: 600
 assembly
                                                        Speed
                                                        Charge press. hpa: 700
Del.quantity cm3/: 153.0...155.0
1000H.: (150.5...157.5)
Dispersion cm3/: 4.00
Opening
pressure, bar : 172...175
                                                                      1000H.: (7.50)
Test inj. tubing : 1 680 750 015
                                                        HIGHEST RATED SPEED
Outside diameter
x Wall thickness
                                                        Setting point:
                   : 6.00x1.50x600
                                                                   1/min : 600
x Length mm
                                                        Speed 
                                                        Contr.-rod trav.mm: $6.0
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                        Testing:
                                                        1st c-rod trav.mm: 11.40
                                                        Speed 1/min: 1030...1045
2nd c-rod trav.mm: 4.00
Speed 1/min: 1100...1130
4th speed 1/min: 1300
    per value:
START OF DELIVERY
Test pressure, bar: 25...27
                                                          C-rod trav.mm : 0.00...1.00
                    : 2.80...2.90
Prestroke mm
                    : (2.75...2.95)
                                                        LOWEST RATED SPEED I
Contr.-rod trav.am: 9.00...12.00
                                                        Control-lever
Cam sequence : 1-5-3-6-2-4
                                                         position degrees: 73...81
```

N14

```
Setting point w/out aux. spring
Speed 1/min : 275
Contr.-rod trav.mm: 7.3
Testing:
            1/min : 100
Speed
C-rod trav.mm min: 8.40
Speed
            1/min : 275
C-rod trav.mm
               : 7.20...7.40
                   : 2.50
C-rod trav.mm
Speed
            1/min : 340...380
YORQUE CONTROL
Dimension a mm : 0.25
Torque-control curve - 1st version
1st speed 1/min: 600
  C-rod trav.mm : 13.00...13.10
2nd speed 1/min: 980
  C-rod trav.mm : 12.40...12.60
3rd speed 1/min: 900
                   : 12.50...12.80
  C-rod travemm
 compensator (LDA,ADA,ALDA)
1st version
Setting
Speed
            1/min : 600
            hPa : 700
Pressure
Contr.-rod trav.mm: 12.80...12.90
Measurement
            1/min : 600
Speed
  C-rod trav.mm : 11.70...11.90
2nd pressure hPa : 340
 C-rod traw.mm
                   : 12.50...12.60
                  : 310
3rd pressure hPa
  C-rod trav.mm
                  : 12.10...12.30
FUEL-DELIVERY CHARACTERISTICS
1st version
Charge press. hPa : 700
Speed 1/min : 980
Speed 1/min: 980
Del.quantity cm3/: 145.5...149.5
1000d.: (142.5...152.5)
Speed
            1/min : 600
Del.quantity cm3/: 130.0...132.0
            1000H.: (127.5...134.5)
STARTING FUEL DELIVERY
Speed
            1/min : 100
Del.quantity cm3/: 245.0...285.0
            1000H.: (241.0...289.0)
Contr.-rod trav.mm: 19.50...21.00
LOW IDLE
```

N15

Speed 1/min: 275 Contr.-rod trav.mm: 7.20...7.40 Del.quantity cm3/: 14.0...19.0 1000H.: (11.5...21.5) Dispersion cm3/: 4.50 1000H.: (7.50)

Remarks: On activation of the starting solenoid, the start position must be reached.

```
Cam sequence : 1-5- 3- 6- 2- 4
BOSCH INJ. PUMP TEST SPECIFICATIONS
Note inst. in remarks column
                                                          SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300
Tolerance + - : 0.50 (0.75)
                     : DAF 11,6 X3
Test sheet
                     : 02.06.87
Edition
Superceeded
Calibrating oil : ISO-4113
                                                         BASIC SETTING
Combination no.
                     : 0 401 846 541
                                                                      1/mi: 600
                                                          1st speed
                                                         Contr.-rod trav.mm: 12.90...13.00
Injection pump
Pump designation : PE6P110A320RS407-1
                                                         Del.quantity cm3/: 15.5...15.7
EP type number
                     : 0 411 816 147
Governor
Governor design.
                                                                         100H.: (15.2...15.9)
                     : RQ275/1100PA864
Governer no.
                     : 0 421 801 400
                                                                         cm3/:0.4
                                                         Dispersion
Customer-spec. information
                                                                         100H.: (0.7)
Customer
                                                         2nd speed 1/min: 275.0

Contr.-rod trav. m: 7.2...7.4

Del.quantity cm3/: 1.4...1.9

100H.: (1.1...2.1)

Dispersion cm3/: 0.4
Engine
                     : LT 210
1st version kW : 210.0
Speed
               1/min: 2200
                                                                         100H.: (0.7)
TEST BENCH EQUIREMENTS
Calibrating-oil inlet temp. C
                                                         SLEEVE POSITION
                     : 38...42
                                                         Control-lever position
                                                                       Degree: -1
1/min: 600
Overflow valve
                                                         Speed
                     : 1 417 413 025
                                                         Cont.-rod travelmm: 15.20...16.40
                                                         FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar: 1.50
                                                         1st version
Calibrating nozzle-holder
                                                         Speed 1/min: 600
Charge press. hPa: 700
Del.quantity cm3/: 155.0...157.0
1000H.: (152.5...159.5)
Dispersion cm3/: 4.00
1000H.: (7.50)
                    : 0 681 343 009
 assembly
Opening
 pressure, bar : 172...175
Test inj. tubing : 1 680 750 015
                                                         HIGHEST RATED SPEED
Outside diameter
x Wall thickness
                                                         Setting point:
                                                                      1/min : 600
x Length mm
                  : 6.00x1.50x600
                                                         Contr.-rod trav.mm: 15.8
(A) Injection pump setting values
    Insp. values in parentheses
Set constant delivery quant.
                                                         Testing:
                                                         1st c-rod trav.mm : 11.50
                                                         Speed 1/min: 1135...1150
2nd c-rod trav.mm: 4.00
    per values ____
                                                                       1/min : 1180...1210
1/min : 1300
START OF DELIVERY
                                                            Speed
                                                         4th speed
Test pressure, bar: 25...27
                                                            C-rod trav.mm : 0.00...1.00
                     : 2.80...2.90
Prestroke mm
                     : (2.75...2.95)
                                                         LOWEST RATED SPEED I
Contr.-rod trav.mm: 9.00...12.00
                                                         Setting point w/out aux. spring
N16
```

Speed 1/min : 275 Contr.-rod trav.mm: 7.3 Testing: 1/min : 100 Speed C-rod trav.mm min: 8.40 1/min : 275 mm : 7.20...7.40 mm : 2.00 Speed C-rod trav.mm C-rod trav.mm 1/min: 350...390 Speed TORQUE CONTROL Dimension a mm : 0.25 Torque-control curve - 1st version 1st speed 1/min: 600 C-rod trav.mm : 13.10...13.20 d speed 1/min : 1080 2nd speed C-rod trav.mm : 12.50...12.70 3rd speed 1/min: 850 C-rod trav.mm : 12.80...12.90 compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 600 Speed Pressure hPa : 700 Contr.-rod trav.mm: 12.90...13.00 Measurement Speed 1/min : 600 1st pressure hPa : -C-rod trav.mm : 11.70...11.90 2nd pressure hPa : 310 : 12.60...12.70 C-rod trav.mm 3rd pressure hPa : 270 C-rod trav.mm : 12.10...12.30 FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa: 700 1/min : 1080 Speed Del.quantity cm3/: 147.0...151.0 1000H.: (144.0...154.0) Charge press. hPa : -Spæed 1/min: 600 Del.quantity cm3/: 130.0...132.0 1000H.: (127.5...134.5) STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 245.0...285.0 1000H.: (241.0...289.0) Contr.-rod trav.mm: 19.50...21.00

N17

LOW IDLE

Remarks: Check electrically unlatched starting fuel delivery (EES) with 24 volt.

```
BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                          : 1-5-3-6-2-
                                                       Cam sequence
Note inst. in remarks column
                                                      SD ang. spacing ^{\circ} CS: 0-60-120-180-240-300 Tolerance + - ^{\circ} : 0.50 (0.75)
                    : DAF 11.6M14
: 02.06.87
Test sheet
Edition
Superceeded
Calibrating oil : ISO-4113
                                                       BASIC SETTING
                    : 0 401 846 542
Combination no.
                                                                      1/mi: 600
                                                       1st speed
Injection pump
                                                       Contr.-rod trav.mm: 11.40...11.50
Pump designation : PE6P100A320RS384-1
                    : 0 411 806 189
                                                       Del.quantity cm3/: 9.8...10.0
EP type number
Governor
Governor design.
                    : RQ225/1000PA868
                                                                     100H.: (9.6...10.2)
Governer no.
                    : 0 421 801 403
                                                      Dispersion
                                                                     cm3/:0.3
Customer-spec. information
Customer
                    : DAF
                                                                     100H.: (0.6)
                                                      2nd speed 1/min: 250.0
Contr.-rod trav. m: 7.5...7.7
Del.quantity cm3/: 0.9...1.3
100H.: (0.6...1.5)
Engine
                    : DKDL 1160 SB 220
                  : 220.0
1st version kW
Speed
              1/min: 2000
                                                                     cm3/:0.3
                                                      Dispersion
TEST BENCH REQUIREMENTS
                                                                     100H.: (0.5)
Calibrating-oil inlet temp. °C
                                                       SLEEVE POSITION
                    : 38...42
                                                      Control-lever position
                                                                   Degree: -1
1/min: 550
Overflow valve
                                                      Speed
                                                      Cont.-rod travelmm: 15.20...16.40
                    : 1 417 413 025
                                                      FULL-LOAD DELIV. AT FULL-LOAD STOP
Inlet press., bar: 1.50
Calibrating nozzle-holder
                                                      1st version
                   : 0 681 343 009
                                                                     1/min: 600
 assembly
                                                      Speed
                                                      Del.quantity cm3/: 98.0...100.0
1000H: (96.0...102.0)
Dispersion cm3/: 3.50
Opening
 pressure, bar
                   : 172...175
                                                                    1000H.: (6.00)
Test inj. tubing : 1 680 750 015
                                                      HIGHEST RATED SPEED
Outside diameter
                                                      Setting point:
                                                                   1/min : 550
x Wall thickness
                                                      Speed
                   : 6.00x1.50x600
                                                      Contr.-rod trav.mm: 15.8
x Length mm
                                                      Testing:
(A) Injection pump setting values
                                                      1st c-rod trav.mm : 9.60
    Insp. values in parentheses
    Set constant delivery quant.
                                                         Speed
                                                                 1/min : 1045...1060
                                                      2nd c-rod trav.mm: 4.00
    per values ____
                                                                  1/min : 1100...1130
1/min : 1250
                                                        Speed
START OF DELIVERY
                                                      4th speed
                                                        C-rod trav.mm : 0.00...1.00
Test pressure, bar: 25...27
                                                      LOWEST RATED SPEED I
Prestroke mm
                    : 3.20...3.30
                    : (3.15...3.35)
                                                      Setting point w/out aux. spring
Contr.-rod trav.mm: 9.00...12.00
                                                      Speed
                                                                1/min : 250
```

N18

```
Contr.-rod trav.mm: 7.6
Testing:
               1/min : 100
Speed
C-rod trav.min min: 8.40
Speed 1/min: 250
C-rod trav.mm: 7.50...7.70
C-rod trav.mm: 2.00
               1/min : 345...385
Speed
TORQUE CONTROL
Torque-control curve - 1st version
1st speed 1/min: 600
C-rod trav.mm : 11.40...11.50
2nd speed 1/min : 1000
C-rod trav.mm : 10.60...10.80
3rd speed 1/min : 820
  C-rod trav.mm : 11.20...11.40
4th speed 1/min : 900
  C-rod trav.mm : 10.80...11.10
FUEL-DELIVERY CHARACTERISTICS
Speed
              1/min : 1000
Del.quantity cm3/: 93.0...97.0
1000H:: (90.5...99.5)
STARTING FUEL DELIVERY
               1/min : 100
Speed
Del.quantity cm3/: 180.0...220.0
1000H.: (176.0...224.0)
Contr.-rod trav.mm: 19.50...21.00
LOW IDLE
Speed 1/min: 250
Contr.-rod trav.mm: 7.50...7.70
Del.quantity cm3/: 9.0...13.0
1000H.: (6.5...15.5)
Dispersion cm3/: 3.50
1000H.: (5.50)
Remarks:
```

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang. spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Note inst. in remarks column Test sheet Edition Superceeded : SCA 11.0 R5 : 30.03.87 SD mark cyl. no. : 1 : 1.83 BASIC SETTING Calibrating oil : ISO-4113 1/mi: 600 1st speed Combination no. : 0 401 846 734 Contr.-rod trav.mm: 13.60...13.70 Injection pump Pump designation : PE6P110A72ORS3040 Del.quantity cm3/: 17.5...17.7 EP type number : 0 411 816 713 100H.: (17.3...17.9) Governor Governor design. : RQV200...1000PA555 Governer no. : 0 421 813 280 cm3/:0.6Dispersion 100H.: (0.8) Customer-spec. information Customer : SCANTA 1/min: 225.0 2nd speed Contr.-rod trav. m: 4.4...4.6
Del.quantity cm3/: 1.7...2.1
100H.: (-)
Dispersion cm3/: 0.2
100H.: (0.4) Engine : DS11 14 TEST BENCH REQUIREMENTS Calibrating-oil inlet temp. °C : 38...42 SLEEVE POSITION Overflow valve Control-lever position Degree: -1 Speed 1/min: 1050 Cont.-rod travelmm: 15.20...17.80 : 1 417 413 025 Inlet press., bar : 1.50 FULL-LOAD DELIV. AT FULL-LOAD STOP Calibrating nozzle-holder : 0 681 343 009 assembly 1st version Speed 1/min: 600 Opening Charge press. hPa: 700
Del.quantity cm3/: 175.0...177.0
1000H.: (173.0...179.0)
Dispersion cm3/: 6.00 pressure, bar : 172...175 Test inj. tubing : 1 680 750 015 1000H.: (8.00) Outside diameter HIGHEST RATED SPEED x Wall thickness : 6.00x1.50x600 x Length mm 1st version Control-lever (A) Injection pump setting values position degrees: 56...64 Insp. values in parentheses Set constant delivery quant. Testing: per values ____ 1st c-rod trav.mm : 12.60 Speed 1/min: 1040...1050 START OF DELIVERY 2nd c-rod trav.mm : 4.00 Speed 1/min: 1150...1180 4th speed 1/min: 1300 Test pressure, bar: 25...27 C-rod trav.mm : 0.00...1.00 : 3.30...3.40 : (3.25...3.45) Prestroke mm LOWEST RATED SPEED I Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5-3-6-2-4 Control-lever position degrees: 5...13

Testing: Speed 1/min : 100 C-rod trav.mm min: 5.90 Speed 1/min : 225 C-rod trav.min : 4.40...4.60 : 2.00 C-rod trav.mm 1/min : 320...380 Speed compensator (LDA_ADA_ALDA) 1st version Setting 1/min : 500 Speed Pressure hPa : 700 Contr.-rod trav.mm: 13.60...13.70 Measurement 1/min : 500 Speed 1st pressure hPa : -: 11.70...11.80 C-rod trav.mm 2nd pressure hPa : 410 C-rod trav.mm : 13.20...13.30 3rd pressure hPa : 260 C-rod trav.mm : 12.20...12.40 FUEL-DELIVERY CHARACTERISTICS 1st version Charge press. hPa : 700 1/min: 1000 Speed Del.quantity cm3/: 169.5...174.5 1000H.: (167.0...177.0) Charge press. hPa : -Speed 1/min: 500 Del.quantity cm3/: 127.0...131.0 1000H.: (125.0...133.0) STARTING FUEL DELIVERY Speed 1/min : 100 Del.quantity cm3/: 240.0...290.0 1000H.: (-) Contr.-rod trav.mm: 20.00...21.00 LOW IDLE 1/min : 225 Speed Contr.-rod trav.mm: 4.40...4.60 Del.quantity cm3/: 17.0...21.0 Dispersion cm3/: 2.00 1000H.: (4.00) Remarks: ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Start of delivery - engine: 20° before TDC Firing sequence of engine: 1-5-3-6-2-4.

Scania test specifications taken over on Aug. 30, 1984

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BOSCH INJ. PUMP TEST SPECIFICATIONS
                                                                 Test pressure, bar: 25...27
Note inst. in remarks column
                                                                                         : 4.00...4.10
                                                                 Prestroke mm
                                                                                         : (3.95...4.15)
Test sheet : MB 11.0 M
Edition : 21.5.87
Superceeded : 12.9.86
Calibrating oil : ISO-4113
                                                                 Contr.-rod trav.mm: 9.00...12.00
Cam sequence : 6- 3- 5- 2- 4- 1
                                                                 SD ang. spacing CS: 0-45-120-165-240-285
Tolerance + - : 0.50 (0.75)
Combination no.
                       : 0 401 846 741
Injection pump
Pump designation : PE6P110A320 $3814
EP type number : 0 411 816 721
                                                                 SD mark cyl. no. : 6
                                                                 BASIC SETTING
Governor
Governor design. : RQV350...1150PA378R
Governer no. : 0 421 813 294
                                                                                 1/mi: 1150
                                                                 1st speed
                                                                 Contr.-rod trav.mm: 12.70...12.80
Customer-spec. information
Customer
                       : DAIMLER-BENZ
                                                                 Del.quantity cm3/: 13.4...13.6
Engine
                       : 0M421
                                                                                   100H.: (13.1...13.8)
1st version kW : 159.0
                                                                                  cm3/:0.4
Speed 1/min: 2300
                                                                 Dispersion
2nd version kW : 159.0
                 1/min: 2300
                                                                                   100H.: (0.8)
Speed
                                                                 2nd speed 1/min: 350

Contr.-rod trav. m: 8.2...8.4

Del.quantity cm3/: 1.3...1.9

100H.: (1.0...2.1)

Dispersion cm3/: 0.4

100H.: (0.8)
TEST BENCH REQUIREMENTS
Calibrating-oil inlet temp. OC
                        : 38...42
Overflow valve
                        : 1 417 413 025
                                                                 1st speed
                                                                                  1/min: 1130
                                                                 Contr.-rod trav.mm: 12.7...12.8
Del.quantity cm3/: 12.3...12.5
100H.: (-)
Dispersion cm3/: 0.4
100H.: (0.7)
2nd speed 1/min: 350
Inlet press., bar: 1.50
Overflow
 quantity min. 1/h: 100...110
Calibrating nozzle-holder
 assembly : 0 681 343 009
                                                                 Contr.-rod trav.mm: 8.20...8.40
                                                                 Del.quantity cm3/: 1.3...1.9
100H.: (-)
Dispersion cm3/: 0.4
100H.: (0.7)
Opening
 pressure, bar : 172...175
Test inj. tubing : 1 680 750 015
                                                                 (B) Setting of injection pump with
                                                                      externally-mounted governor
Outside diameter
x Wall thickness
                                                                 SLEEVE TRAVELS
                                                                 1st speed 1/min: 300
Sleeve travel mm: 0.60...0.90
2nd speed 1/min: 580
Sleeve travel mm: 3.60...3.70
3rd speed 1/min: 870
x Length mm
                       : 6,00x1,50x600
(A) Injection pump setting values
     Insp. values in parentheses
     Set constant delivery quant.
                                                                   Sleeve travel mm: 5.20...5.30
     per values ____
                                                                 4th speed 1/min: 1150
START OF DELIVERY
                                                                   Sleeve travel mm: 7.60
N22
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```
SLEEVE POSITION
Control-lever position
             Degree: -1
              1/min: 1150
Cont.-rod travelmm: 15.20...17.80
FULL-LOAD DELIV. AT FULL-LOAD STOP
1st version
              1/min: 1150
Speed
Del.quantity cm3/: 134.0..136.0
             1000H.: (131.5...138.5)
cm3/ : 4.00
1000H.: (8.00)
Dispersion
2nd version
Speed
              1/min: 1130
Del.quantity cm3/: 123.0...125.0
             1000H.: (120.0...128.0)
cm3/: 4.0
Dispersion
             1000H.: (8.0)
HIGHEST RATED SPEED
1st version
Control-lever
 position degrees: 62...70
Testing:
1st c-rod trav.mm : 11.70
            1/min: 1180...1190
  Speed
2nd c-rod trav.mm: 4.00
            1/min: 1285...1315
  Speed
3rd c-rod trav.mm: 1400
           1/min : 0.00...1.00
  Speed
2nd version
Control-lever
position degrees: 62...70
Testing:
1st c-rod trav.mm : 11.70
            1/min: 1180...1190
  Speed
2nd c-rod trav.mm: 4.00
            1/min: 1285...1315
  Speed
3rd c-rod trav.mm: 1400
            1/min: 0.00...1.00
  Speed
LOWEST RATED SPEED I
Control-lever
 position degrees: 12...20
Testing:
            1/min: 100
Speed
C-rod trav.mm min: 6.50
Speed 1/min: 350
                   : 8.20...8.40
C-rod trav.mm
CONSTANT REGULATION
```

1/min: 375...485

```
SWITCH-OVER POINT
              1/min : 270 (290)
Speed
FUEL-DELIVERY CHARACTERISTICS
              1/min : 600
Speed
Del.quantity cm3/: 113.0...117.0
1000H.: (110.0...120.0)
              cm3/: 6.00
1000H.: (9.00)
Dispersion
              1/min: 1150
Speed
Del.quantity cm3/: 93.0...97.0 * 1000H.: (90.0...100.0)
              cm3/: 6.00
1000H.: (9.00)
Dispersion
              1/min:
Speed
Del.quantity cm3/: -
              1000H.: (-)
Remarks:
Version 1: Without return-flow
restriction
Version 2: With return-flow restriction
* = Set at reduced-delivery stop.
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Špeěd

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang: spacing CS: 0-60-120-180-240-300 Tolerance + - : 0.50 (0.75) Note inst. in remarks column Test sheet : VOL 10,0 0 SD mark cyl. no. : 1 : 12.06.87 Edition Superceeded : 12.9.86 BASIC SETTING : ISO-4113 Calibrating oil 1st speed 1/mi: 700 Combination no. : 0 401 846 745 Contr.-rod trav.mm: 12.30...12.40 Injection pump Del.quantity cm3/: 16.7...16.9 Pump designation : PE6P110A320RS3080 EP type number : 0 411 816 722 100H.: (16.4...17.2) Governor Governor design.: RQV250...1100PA589 Governer no. : 0 421 813 307 Dispersion cm3/:0.4Customer-spec. information 100H.: (0.7) : VOLVO Customer 2nd speed 1/min: 250.0 Contr.-rod trav. m: 3.8...4.0 Del.quantity cm3/: 1.5...1.9 : TD100GA Engine 100H.: (1.2...2.1) cm3/: 0.3 TEST BENCH REQUIREMENTS Dispersion Calibrating-oil inlet temp. °C 100H.: (0.6) inlet temp. ' : 38...42 (B) Setting of injection pump with externally-mounted governor Overflow valve : 1 417 413 025 SLEEVE TRAVELS 1st speed 1/min: 250 Inlet press., bar : 1.50 Sleeve travel mm: 1.20...1.30 Calibrating nozzle-holder 2nd speed 1/min: 370 Sleeve travel mm: 2.60...3.00

3rd speed 1/min: 430

Sleeve travel mm: 3.50...3.90

4th speed 1/min: 1160 : 0 681 343 009 assembly Opening pressure, bar : 172...175 Sleeve travel mm: 8.10...8.30 5th speed 1/min: 1210 Test inj. tubing : 1 680 750 015 Sleeve travel mm: 9.40...9.60 Outside diameter SLEEVE POSITION x Wall thickness Control-lever position Degree: -1 1/min: 1180 x Length mm : 6.00x1.50x600 Cont.-rod travelmm: 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses Set constant delivery quant. FULL-LOAD DELIV. AT FULL-LOAD STOP per values ____ 1st version 1/min: 700 START OF DELIVERY Speed Charge press. hPa : 900 Test pressure, bar: 25...27 Del.quantity cm3/: 167.0...169.0 1000H.: (164.0...172.0) Dispersion cm3/: 4.00 : 3.50...3.60 Prestroke mm : (3.45...3.65) 1000H.: (7.50) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 HIGHEST RATED SPEED 1st version

Control-lever position degrees: 59...67 Testing: 1st c-rod trav.mm : 11.30 Speed 1/min: 1160...1170 2nd c-rod trav.mm: 4.00 Speed 1/min: 1220...1250 4th speed 1/min: 1350 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 4...12 Testing: 1/min : 100 Speed C-rod trav.mm min : 5.30 Speed 1/min : 250 C-rod trav.mm : 3.80...4.00 CONSTANT REGULATION Speed 1/min : 270...380 compensator (LDA, ADA, ALDA) 1st version Setting 1/min : 500 hPa : 900 Speed Pressure Contr.-rod trav.mm: 12.30...12.40 Measurement 1/min : 500 Speed 1st pressure hPa : -C-rod trav.mm : 9.80...9.90 2nd pressure hPa : 610 C-rod trav.mm : 12.10...12.20 3rd pressure hPa : 280 C-rod trav.mm : 10.10...10.30 FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : -1/min : 700 Speed Del.quantity cm3/: 121.0...124.0 1000H.: (118.5...126.5) STARTING FUEL DELIVERY 1/min : 100 Speed Del.quantity cm3/: 160.0...190.0 1000H.: (156.0...196.0) Contr.-rod trav.mm: 20.00...21.00 LOW IDLE

Remarks:
Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90

m

BOSCH INJ. PUMP TEST SPECIFICATIONS SD ang. spacing 0 CS: 0-60-120-180-240-300 Tolerance + - 10 : 0.50 (0.75) Note inst. in remarks column Test sheet Edition Superceeded : VOL 10.0 Q5 : 13.05.87 SD mark cyl. no. : 1 : 6.85 BASIC SETTING Calibrating oil : ISO-4113 1/mi: 700 1st speed Combination no. : 0 401 846 753 Centr.-rod trav.mm: 11.50...11.60 Injection pump Pump designation : PE6P110A320RS3108 Del.quantity cm3/: 14.8...15.0 EP type number : 0 411 816 727 Governor 100H.: (14.5...15.3) Governor design. : RQV325...1100PA232 Governer no. : 0 421 813 309 Dispersion cm3/:0.4100H.: (0.8) Customer-spec. information : VOLVO-BM Customer 2nd speed 1/min: 325.0 Contr.-rod trav. m: 3.9...4.1 Del.quantity cm3/: 1.6...2.0 100H.: (1.3...2.2) : TD100G Engine TEST BENCH REQUIREMENTS cm3/: 0.3Dispersion Calibrating pil 100H.: (0.6) : 38...42 (B) Setting of injection pump with externally-mounted governor Overflow valve : 1 417 413 025 SLEEVE TRAVELS Inlet press., bar: 1.50 1st speed 1/min: 325 Sleeve travel mm: 1.60...1.70 2nd speed 1/min: 500 Calibrating nozzle-holder Sleeve travel mm: 2.80...3.20

3rd speed 1/min: 800

Sleeve travel mm: 5.00...5.20

4th speed 1/min: 1100

Sleeve travel mm: 7.60...7.80 : 0 681 343 009 assembly Opening pressure, bar : 172...175 5th speed 1/min: 1200 Sleeve travel mm: 8.70...9.00 Test inj. tubing : 1 680 750 015 Outside diameter SLEEVE POSITION x Wall thickness Control-lever position : 6.00x1.50x600 Degree: -1 1/min: 1175 x Length mm (A) Injection pump setting values Cont.-rod travelmm: 15.20...17.80 Insp. values in parentheses Set constant delivery quant. FULL-LOAD DELIV. AT FULL-LOAD STOP per values ____ 1st version Speed 1/min: 700 Charge press. hPa: 700 START OF DELIVERY Test pressure, bar: 25...27 Del.quantity cm3/: 148.0...150.0 1000H.: (145.0...153.0) Dispersion cm3/: 4.00 1000H.: (8.00) : 3.00...3.10 Prestroke mm : (2.95...3.15) Contr.-rod trav.mm: 9.00...12.00 Cam sequence : 1-5- 3- 6- 2- 4 HIGHEST RATED SPEED 1st version

Control-lever position degrees: 40...48 Testing: 1st c-rod trav.mm : 10.50 Speed 1/min: 1140...1150 2nd c-rod trav.mm: 4.00 1/min : 1220...1250 Speed 4th speed 1/min: 1350 C-rod trav.mm : 0.00...1.00 LOWEST RATED SPEED I Control-lever position degrees: 7...15 Testing: 1/min : 100 Speed C-rod trav.mm min : 5.40 1/min : 325 Speed C-rod trav.mm : 3.90...4.10 : 2.00 C-rod trav.mm 1/min: 340...400 Speed compensator (LDA,ADA,ALDA) 1st version Setting 1/min : 500 hPa : 700 Speed Pressure Contr.-rod trav.mm: 11.50...11.60 Measurement 1/min : 500 Speed 1st pressure hPa : -: 9.70...9.80 C-rod trav.mm 2nd pressure hPa : 500 o-rod trav.mm : 11.30...11.40 3rd pressure hPa : 300 G-rod trav : 10.00...10.20 C-rod trav.mm FUEL-DELIVERY CHARACTERISTICS Charge press. hPa : -Speed 1/min: 700 Del.quantity cm3/: 115.0...117.0 1000H.: (112.0...120.0) STARTING FUEL DELIVERY LOW IDLE 1/min: 325 Speed

N27

Contr.-rod trav.mm: 3.90...4.10
Del.quantity cm3/: 16.0...20.0
1000H.: (13.5...22.5)
Dispersion cm3/: 3.00
1000H.: (6.00)

Remarks: